PROCEDURES IN MEDICINE AND GASTROENTEROLOGY

For Medical Students & House Officers

BY

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ACKNOWLEDGEMENT

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"William Osler"

" There are only two sorts of doctors: those who practice with their brains, and those who practice with their tongues"

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PROCEDURE 1

COLONOSCOPY AND COLON CANCER SCREENING

Colonoscopy and Colon Cancer Screening: An exam using a tube-like instrument to look inside the rectum and colon for polyps, abnormal areas or cancer. Tissue samples can be collected (biopsy) and abnormal growths can be removed. It is a test that doctors use to examine the inside of the entire large intestine (colon), where a slim, flexible tube tipped with a camera is inserted into the rectum to find abnormal spots and colorectal cancer.

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PROCEDURE 2

BALLOON-ASSISTED ENDOSCOPY

Balloon-Assisted Endoscopy: A balloon inflating the sides of the bowel allows an endoscope to reach farther into the bowel for a visual examination.

Balloon assisted or "deep" enteroscopy is a procedure which allows advancement of a long endoscope into the small intestine for both diagnostic and therapeutic purposes.

There are two types of balloon assisted enteroscopy systems: the Double Balloon Enteroscopy (DBE) system, which uses two balloons; and the Single Balloon Enteroscopy (SBE) system which employs only a single

balloon. A third type of device which uses a spiral overtube (Spirus) without balloon technology can also provide deep access into the small bowel.

The balloon assisted enteroscopy technique advances the endoscope through the small bowel by alternately inflating and deflating balloons, and bringing the small bowel to the endoscopist by pleating the bowel over an overtube, just like pulling a curtain over a rod.

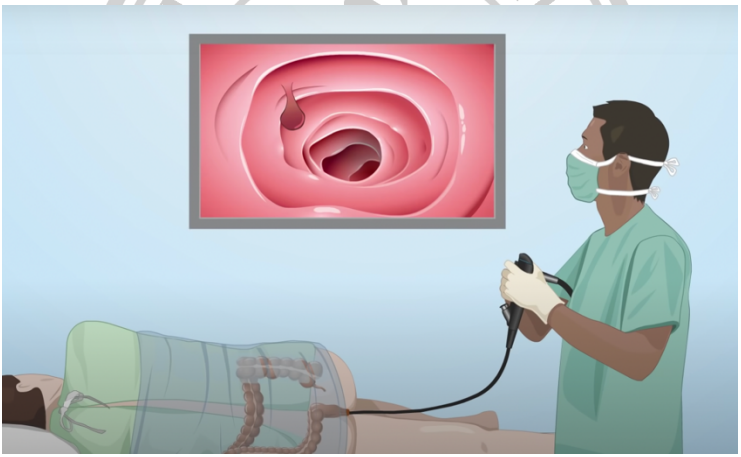
The procedure can be performed via the upper gastrointestinal (GI) tract (antegrade) or through the lower GI tract (retrograde).

The procedure requires sedation or anesthesia and may take several hours. On rare occasions, X-ray or fluoroscopy may be used for better localization.

The procedure may be indicated for patients who have problems in the small intestine including bleeding, strictures, abnormal tissue, polyps, or tumors.

Therapies using the balloon assisted enteroscopy scope include treatment of bleeding lesions, dilation (stretching open) of strictures, removal of polyps or masses, biopsy of abnormal tissue, and removal of foreign objects.

Balloon Enteroscopy is a safe procedure with risks similar to those for colonoscopy or upper endoscopy (EGD). Rare instances of mild pancreatitis or ileus (less than one percent) have been reported.



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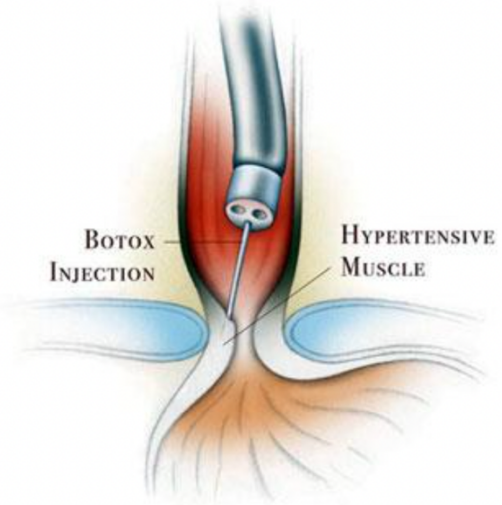
PROCEDURE 3

BOTULINUM TOXIN

Botulinum Toxin Injection for Achalasia. Injection of botulinum toxin into muscles causes temporary paralysis of the specific muscle, which lasts for months to over one year. In gastroenterology, botulinum toxin is used primarily to treat achalasia. Botulinum toxin is injected into the muscle of the lower oesophageal sphincter.



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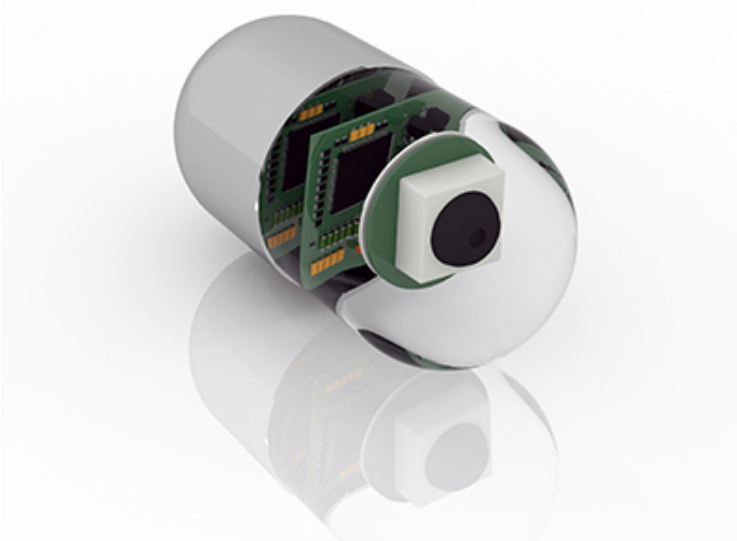
PROCEDURE 4

CAPSULE ENDOSCOPY

Capsule Endoscopy: A capsule containing a camera is swallowed by the patient to take pictures along the digestive tract not easily reachable by other procedures. (The capsule passes normally in the stool.)

Capsule endoscopy is a procedure that uses a tiny wireless camera to take pictures of your digestive tract. A capsule endoscopy camera sits inside a vitamin-size capsule you swallow. As the capsule travels through your digestive tract, the camera takes thousands of pictures that are transmitted to a recorder you wear on a belt around your waist.

Capsule endoscopy helps doctors see inside your small intestine — an area that isn't easily reached with more-traditional endoscopy procedures. Traditional endoscopy involves passing a long, flexible tube equipped with a video camera down your throat or through your rectum.



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PROCEDURE 5

CRYOTHERAPY

Cryotherapy: Cryotherapy uses extreme cold to freeze and destroy tissue. It has been used for decades to treat common skin lesions, such as warts.

In the GI tract, cryotherapy can be performed using devices designed for use with endoscopes. During cryotherapy, a cryogen (a substance used to produce very low temperatures) is used to freeze the target tissue, and repeated freeze/thaw cycles result in the destruction of abnormal tissue.

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PROCEDURE 6

ENDOFLIP

EndoFLIP (endoluminal functional lumen imaging probe) is a technology that simultaneously measures the area across the inside of a gastrointestinal organ (for example, the esophagus) and the pressure inside that organ.

EndoFLIP is a newer, minimally invasive type of technology that can be used during endoscopy to measure the dimensions, movement, and pressure inside the esophagus and other organs. The ratio of these measurements is called distensibility, or the ability to stretch under pressure.

It also allows an assessment of the motility of the esophagus while the patient is under anesthesia.

Our equipment allows us to assess not only the distensibility, but also the presence of peristalsis in a less-invasive way.

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PROCEDURE 7

ERCP

Endoscopic Retrograde Cholangiopancreatography (ERCP): Uses an endoscope to visually examine the pancreas and bile ducts.

ERCP is done to examine and check for abnormalities in your biliary system (liver, bile ducts, gallbladder, and pancreas). The procedure involves the use of an endoscope, which is guided by an X-ray.

During the procedure, your gastroenterologist will pass the endoscope through your mouth, then

down your esophagus, stomach, all the way to your small intestine.

Your doctor will then pass a very thin tube through the endoscope and administer a dye to highlight your organs on X-ray and thoroughly examine them for potential problems (e.g., tumors, blockages in the pancreatic ducts, infection in the bile ducts, etc.). Your GI doctor may also perform a biopsy and remove gallstones or blockages within the same procedure.

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PROCEDURE 8

ENDOSCOPIC U/S

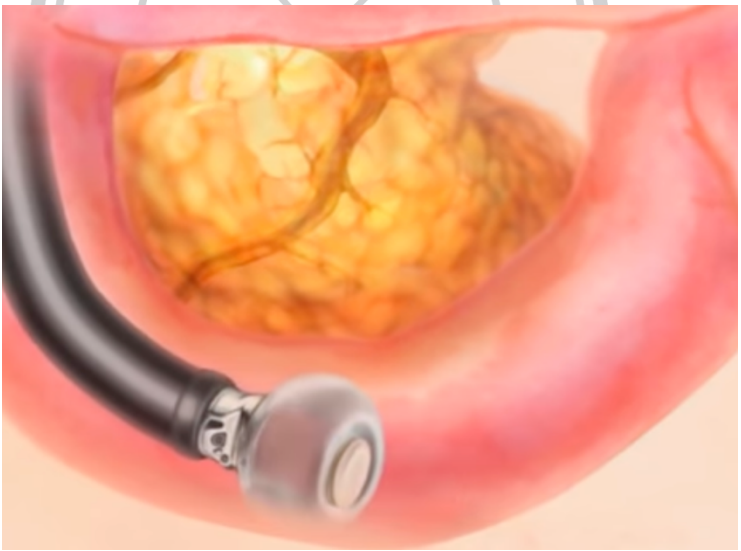
Endoscopic Ultrasound: Uses an endoscope to examine the upper and lower gastrointestinal tract, and then creates detailed pictures using ultrasound imaging.

It utilizes a special endoscope with an ultrasound probe attached to it to evaluate and diagnose problems in the upper and lower digestive tract. The procedure allows your gastroenterologist to:

- View your internal structures and detect abnormal growths (e.g., tumors) in your pancreas;
- Check for stones in your biliary ducts (structures responsible for transporting

bile from your liver and gallbladder through your pancreas to your small intestine); and

- Diagnose (i.e., perform a biopsy) and determine the stage of gastrointestinal cancer.



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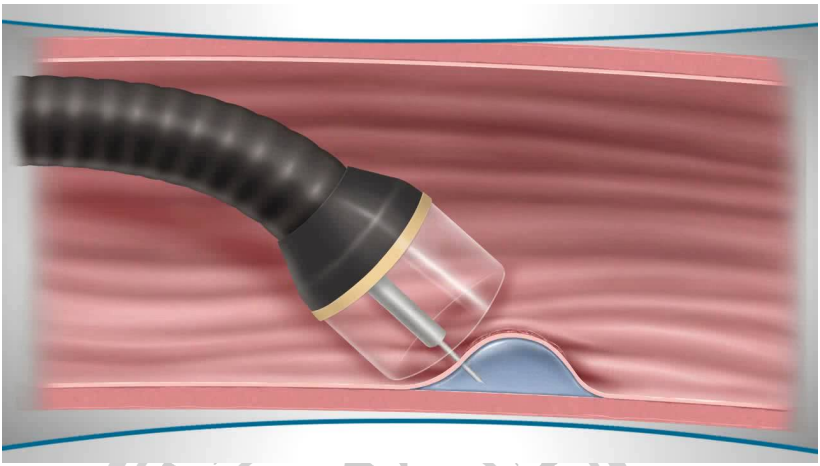
PROCEDURE 9

EMR

Endoscopic Mucosal Resection (EMR): For people with Barrett's Disease, this procedure uses an endoscope and the injection of a solution into the esophagus or stomach to raise and remove a lesion for examination.

Gastrointestinal EMR is a procedure to remove precancerous, early-stage cancer or other abnormal tissues (lesions) from the digestive tract. Endoscopic mucosal resection is performed with a long, narrow tube equipped with a light, video camera and other instruments.



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BRAVO

Bravo (catheter-free or wireless) esophageal pH monitoring study: A small capsule is attached to the lining of the esophagus during an upper endoscopy to measure acidic reflux over a 48-hour period. The capsule sends these measurements wirelessly to a small receiver that the patient wears. (The capsule passes normally in the stool.)

The BravoTM pH test measures the pH level of your esophagus. The pH level of a substance tells whether something is basic or acidic. Sometimes, stomach acid backs up into the esophagus (the tube that connects the throat to the stomach, or the

"food pipe") which can increase the acidity level within your esophagus.

Stomach acid isn't the only thing that can back up into the esophagus. Food particles and other digestive juices can also splash back. When reflux occurs on a regular basis, it can cause permanent damage to the esophagus. The Bravo pH test reveals how often stomach contents reflux into the lower esophagus and how much acid the reflux contains.

If your healthcare provider thinks you might have gastroesophageal reflux disease (GERD), they

might ask you to have a Bravo pH test. People who are diagnosed with GERD often experience:

- Heartburn.
- Chest pain.
- Coughing.
- Sore throat or hoarse voice.

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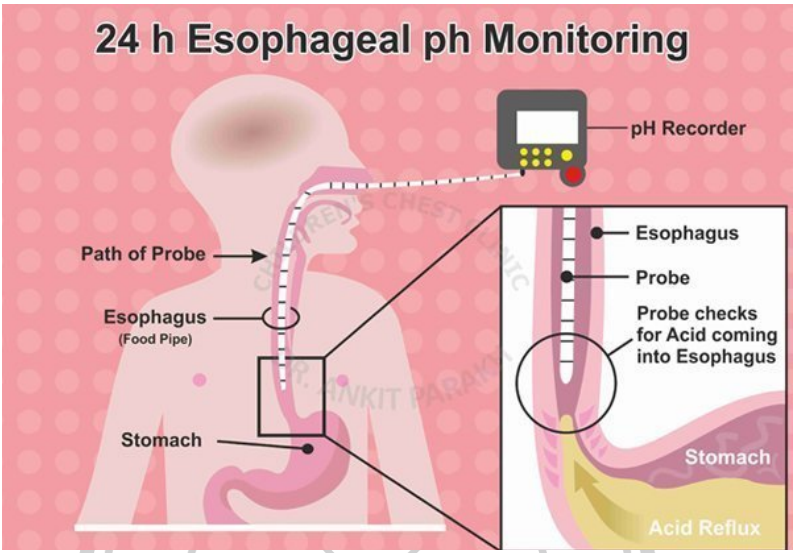
PROCEDURE 11

IMPEDANCE REFULX MONITORING

Esophageal 24-hour pH/impedance reflux monitoring: A catheter is placed through the nasal passage into the esophagus to record amount of reflux over a 24-hour period.

Esophageal 24-hour pH/impedance reflux monitoring measures the amount of reflux (both acidic and non-acidic) in your esophagus during a 24-hour period, and assesses whether your symptoms are correlated with the reflux. This test is performed by experienced technicians and is interpreted bycgastroenterologists with dedicated expertise in esophageal reflux monitoring.


24 h Esophageal ph Monitoring
pH Recorder
Path of Probe
Esophagus
(Food Pipe)
Stomach
Esophagus
Probe
Probe checks
for Acid coming
into Esophagus
Stomach
Acid Reflux

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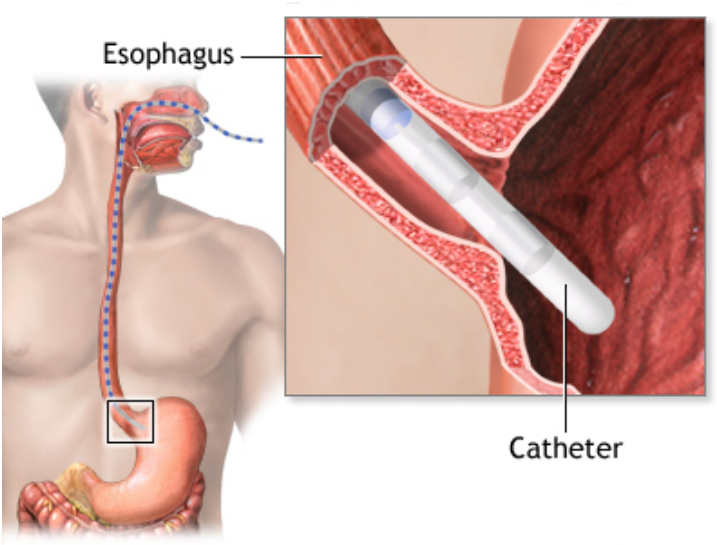
PROCEDURE 12

ESOPHAGEAL MANOMETRY

High Resolution Esophageal Manometry (Esophageal Mano): A catheter is placed through the nasal passage to record the movement and pressures of the esophagus as the patient drinks small amounts of water.

It is a test that shows whether your esophagus is working properly. The esophagus is a long, muscular tube that connects your throat to your stomach. When you swallow, your esophagus contracts and pushes food into your stomach. Esophageal manometry measures the contractions.


Esophagus
Catheter

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PROCEDURE 13

LIVER BIOPSY

Liver Biopsy: Uses a needle to remove a sample of liver tissue for examination. It is a test that takes a sample of tissue from the liver for examination. A liver biopsy is not a routine procedure, but is performed when it is necessary to determine the presence of liver disease and to look for malignancy, cysts, parasites, or other pathology.

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PROCEDURE 14

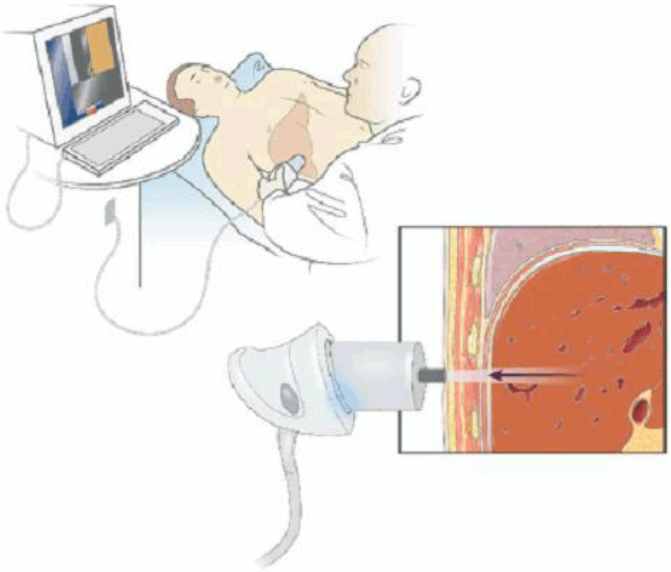
LIVER ELASTOGRAPHY

Liver Elastography: A non-invasive exam using an ultrasound probe to apply pulse waves to the liver to determine how much scar tissue has accumulated from chronic liver diseases.

Liver elastography involves the use of a surface ultrasound probe that delivers a low frequency pulse or shear wave to a small volume of liver tissue under the rib cage. The transmission of the sound wave is completely painless.

The liver is located in the right upper abdomen under the rib cage. Patients are asked to lie flat on an examination table. A technician places the FibroScan probe between the ribs on the right side

of the lower chest wall. A series of 10 painless pulses are then applied to the liver. The results are recorded on the equipment and an overall liver stiffness score is generated. This score is then interpreted by a qualified physician to predict the likelihood of advanced fibrosis or cirrhosis.



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PROCEDURE 15

POEM

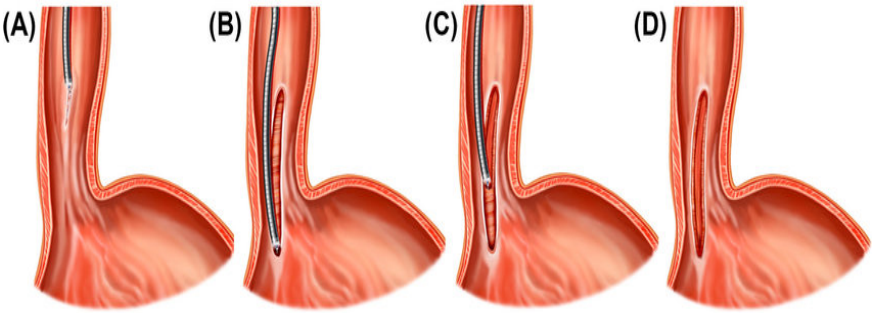
Peroral Endoscopic Myotomy (POEM): Peroral endoscopic myotomy (POEM) is an endoscopic therapy for achalasia.

POEM can be a treatment option for people with muscle disorders in the esophagus, such as achalasia. POEM generally takes up to one hour and is performed under general anesthesia. It is minimally invasive and leaves no visible scars. After the procedure, the care team will monitor your recovery while the sedative wears off. POEM can be done as an outpatient procedure, or it may require an overnight hospital stay. POEM is about 90% effective in relieving esophageal spasms.

POEM is a procedure to treat swallowing disorders caused by muscle problems such as spasms in the esophagus. POEM uses an endoscope — a narrow flexible tube with a camera — that is inserted through the mouth (peroral) to cut muscles in the esophagus (a myotomy). Cutting the muscles loosens them and prevents them from tightening and interfering with swallowing.

POEM is not considered a surgery, since no incision is made through the skin. It is a less invasive alternative to Heller myotomy — a similar procedure that uses small incisions to reach the esophagus instead of access through the

mouth. Endoscopic procedures often mean less pain and a faster recovery than open surgical procedures.



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PROCEDURE 16

PNEUMATIC DILATION

Pneumatic Dilation: An air-filled cylinder-shaped balloon disrupts the muscle fibers of the lower esophageal sphincter, which is too tight in patients with achalasia.

Layers of excess tissue, cancer of the esophagus, and scarring from radiation treatment can all lead to the same problem.

The gastroenterologist stretches the tube by using a plastic dilator or inflating a balloon. They will usually carry this out during an endoscopy.

The gastroenterologist may sedate the person for the procedure. Alternatively, they may apply a local anesthetic spray to the back of the person's throat.