



GHADIALI

General Surgery

P R E S E N T S

Dr. Mufa T. Ghadiali is skilled in all aspects of General Surgery.
His General Surgery Services include:

- General Surgery
- Advanced Laparoscopic Surgery
- Surgical Oncology
- Gastrointestinal Surgery
- Hernia Surgery
- Endoscopy

Gastro Intestinal System (Gi System)

Multimedia Health Education

Disclaimer

This movie is an educational resource only and should not be used to make a decision on Obesity management. All decisions about obesity management should be made in conjunction with your doctor or a licensed healthcare provider.

Mufa T. Ghadiali, M.D., F.A.C.S

Diplomate of American Board of Surgery

6405 North Federal Hwy., Suite 402
Fort Lauderdale, FL 33308

Tel: 954-771-8888

Fax: 954- 491-9485

www.ghadialisurgery.com

GHADIALI

MULTIMEDIA HEALTH EDUCATION MANUAL

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Gastro Intestinal System

The gastro-intestinal system is essentially a long tube running right through the body, with specialised sections that are capable of digesting material put in from the mouth and extracting any useful components from it, then expelling the waste products at the anus.

(Refer fig.1)

Food undergoes three types of processes in the body:

- Digestion
- Absorption
- Elimination

The whole system is under hormonal control, with the presence of food in the mouth triggering off a cascade of hormonal actions; when there is food in the stomach, different hormones activate acid secretion, increased gut motility, enzyme release etc. Etc.

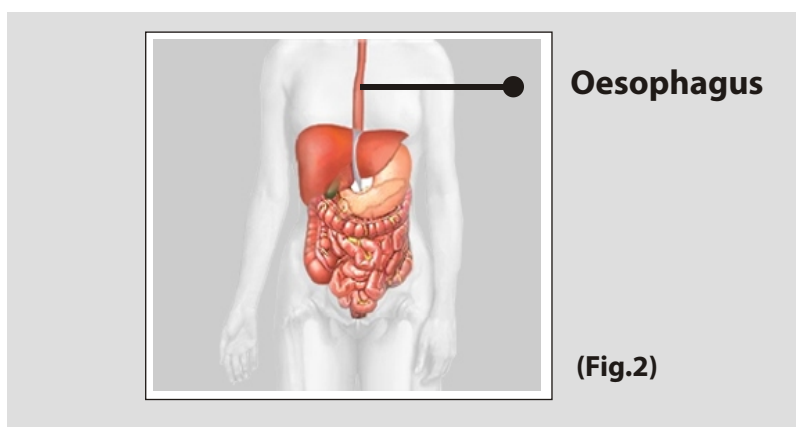
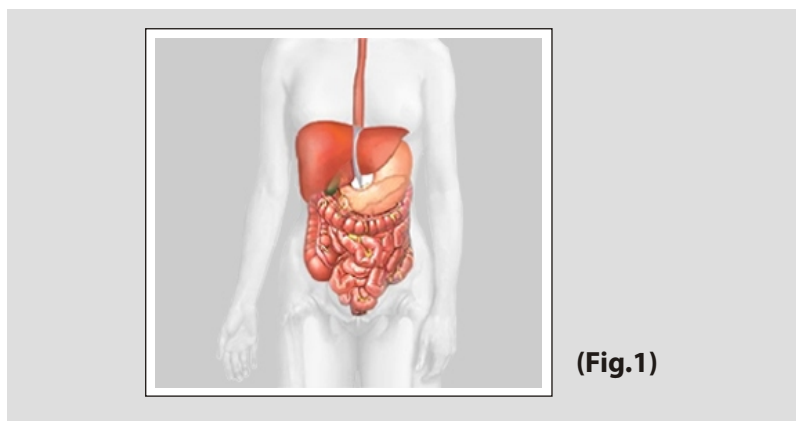
Nutrients from the GI tract are not processed on-site; they are absorbed and taken to the liver through blood circulation to be broken down further, stored, or distributed.

Oesophagus

Once food has been chewed and mixed with saliva in the mouth, it is swallowed and passes down the oesophagus. The oesophagus has a stratified squamous epithelial lining (SE) which protects the oesophagus from trauma; the submucosa (SM) secretes mucus from mucous glands (MG) which aid the passage of food down the oesophagus.

The oesophageal wall is made up of layers of muscle which help to push the food into the stomach by waves of peristalsis.

(Refer fig.2)



Gastro Intestinal System

Stomach

The stomach is a 'j'-shaped organ, with two openings-the oesophageal and the duodenal- and four regions- the cardia, fundus, body and pylorus. Each region performs different functions; the fundus collects digestive gases, the body secretes pepsinogen and hydrochloric acid, and the pylorus is responsible for mucus, gastrin and pepsinogen secretion.

The layer of mucus prevents the stomach from digesting itself. The stomach has five major

- Temporary food storage
- Control the rate at which food enters the small intestine
- Acid secretion and antibacterial action
- Fluidisation of stomach contents
- Preliminary digestion with pepsin, lipases etc.

(Refer fig. 3)

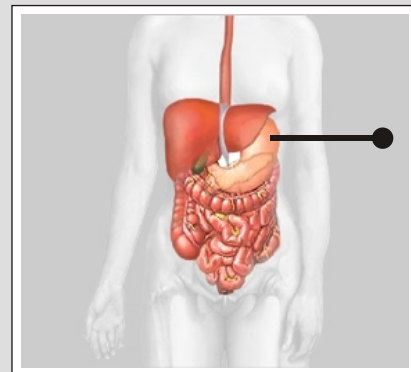
Liver

The liver is the largest organ in the body, normally weighing about 1.5kg (although this can increase to over 10kg in chronic cirrhosis). The liver is the main organ of metabolism and energy production; its other main functions include:

(Refer fig. 4)

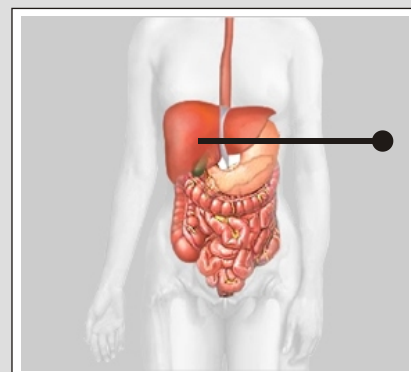
- Bile production (to help in digestion)
- Storage of iron, vitamins and trace elements
- Detoxification of poisons and other products
- Conversion of waste products for excretion by the kidneys
- The liver makes plasma proteins -Albumin and Fibrinogen (Albumin raises the osmotic pressure and fibrinogen is needed for blood clotting)
- Helps in eliminating bacteria from the blood.

The liver is functionally divided into two lobes, right and left.



Stomach

(Fig. 3)



Liver

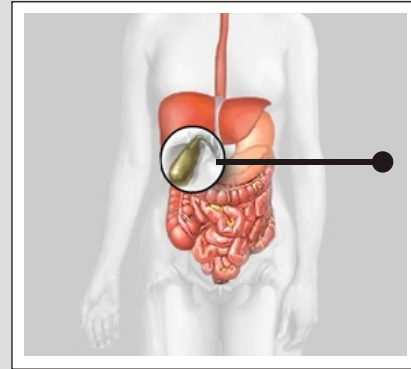
(Fig. 4)

Gastro Intestinal System

Gall Bladder

The gallbladder is a 8 Cm pear-shaped organ which lies just below the liver. It accepts bile from the liver, and stores it. Bile is a watery, greenish-yellowish fluid produced by the liver which aids in the digestion of fatty foods.

(Refer fig. 5)



Gall Bladder

(Fig. 5)

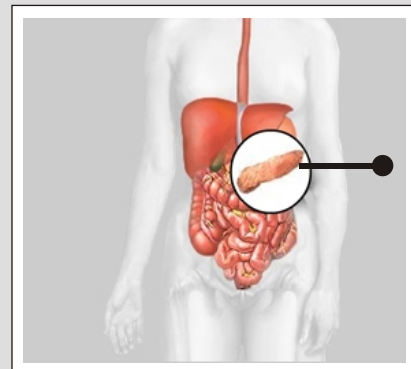
Functions of the gall bladder

- Concentration of bile by the reabsorption of water from it.
- Release bile for absorption of fats and fat-soluble vitamins. When food is digested, the gallbladder releases bile into the small intestine where it is able to help dissolve fats.
- Secretes an enzyme that helps in the digestion of fat.

The most common disorder of the gall bladder is gallstones.

The Pancreas

The pancreas is located in the abdomen, tucked behind the stomach. It is shaped somewhat like a tadpole - fat at one end and slender at the other - and is around 25cm in length. The pancreas has dual roles; it is an organ of the digestive system (exocrine) and of the endocrine (hormonal) system.



The Pancreas

(Fig. 6)

Once food has been mulched and partially digested by the stomach, it is pushed into the duodenum (first part of the small intestine). The pancreas adds its own digestive juices and enzymes to the food, via a small duct attached to the duodenum. This process is said to belong to the 'exocrine pancreas'.

The pancreas also produces the hormone insulin, which helps to control the amount of sugar in the blood. This is the role of the 'endocrine pancreas'.

(Refer fig. 6)

The Pancreas

The Exocrine Pancreas:

The pancreas helps to digest food, particularly protein. Pancreatic juices contain enzymes that only become activated once they reach the duodenum. This is to prevent the protein-digesting enzyme trypsin from 'eating' the protein-based pancreas or its duct. Other enzymes produced by the pancreas include amylase (to break down carbohydrate) and lipase (to break down fats). The exocrine pancreas also makes sodium bicarbonate, which helps to neutralise the stomach acids in the food.

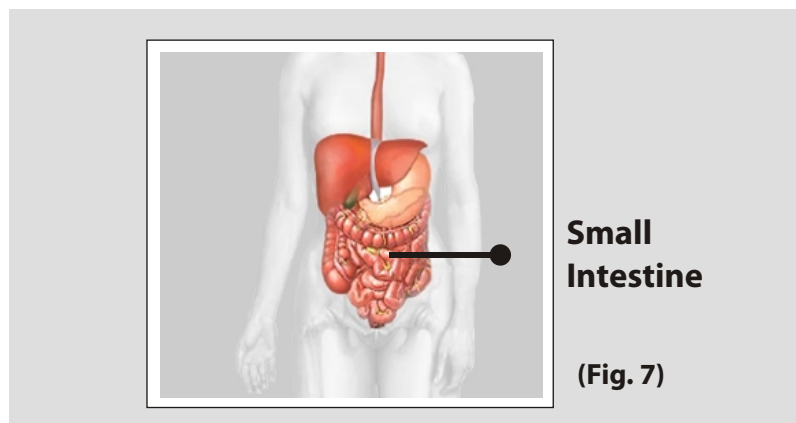
The Endocrine Pancreas

The pancreas makes the hormone insulin, which helps to control blood sugar levels. Insulin is manufactured by a small clump of pancreatic cells called the 'islets of Langerhans'. High blood sugar levels prompt the release of insulin from the islets of Langerhans, so that the sugars can pass into cells. The endocrine pancreas also makes glucagon, another hormone involved in the regulation of blood sugar.

(Refer fig. 6)

Small intestine

The small intestine is the site where most of the chemical and mechanical digestion is carried out, and where virtually all of the absorption of useful materials is carried out. The whole of the small intestine is lined with an absorptive mucosal type, with certain modifications for each section.



The intestine also has a smooth muscle wall with two layers of muscle; rhythmical contractions force products of digestion through the intestine (peristalsis). There are three main sections to the small intestine;

The duodenum forms a 'C' shape around the head of the pancreas. Its main function is to neutralise the acidic gastric contents (called 'chyme') and to initiate further Digestion ; Brunner's glands in the submucosa secrete an alkaline mucus which neutralises the acidic chyme and protects the surface of the duodenum.

The jejunum

(Refer fig. 7)

The ileum. The jejunum and the ileum are the greatly coiled parts of the small intestine, and together are about 4-6 metres long; the junction between the two sections is not well-defined. The mucosa these sections is highly folded (the folds are called plicae), increasing the surface area available for absorption dramatically.

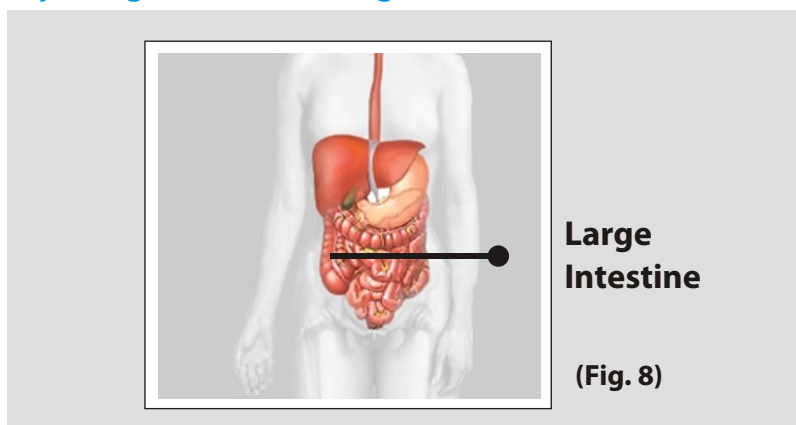
(Refer fig. 7)

Large intestine

The large intestine is the last part of the digestive tube and the location of the terminal phases of digestion. It is that part of the digestive tube between the terminal small intestine and anus. Within the large intestine, three major segments are recognized:

(Refer fig. 8)

- The caecum is a blind-ended pouch that in humans carries a worm-like extension called the vermiform appendix.
- The colon constitutes the majority of the length of the large intestine and is subclassified into ascending, transverse and descending segments.
- The rectum is the short, terminal segment of the digestive tube, continuous with the anal canal.



Functions of Large intestine

- Recovery of water and electrolytes from the digested food:
Considerable amount of water and electrolytes like sodium and chloride remain and must be recovered by absorption in the large gut. This is what goes wrong when you have diarrhea and constipation.
- Formation and storage of feces:
As digested is moved through the large intestine, it is dehydrated, mixed with bacteria and mucus, and formed into feces.
- Microbial fermentation:
Fermentation is the enzymatic decomposition and utilisation of foodstuffs, particularly carbohydrates, by microbes. The large intestine does not produce its own digestive enzymes, but contains huge numbers of bacteria which have the enzymes to digest and utilize many substrates.

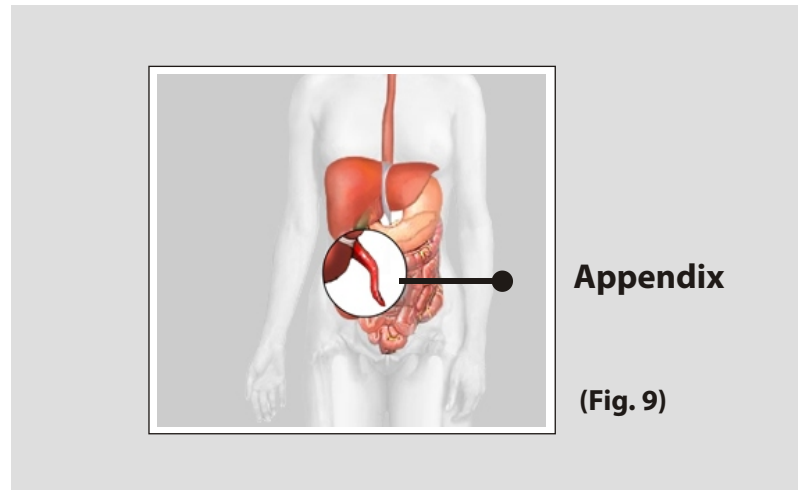
(Refer fig. 8)

Appendix

Vermiform Appendix is an outgrowth of the caecal part of the larger intestine of the GI system. In humans it is a vestigial organ containing lymphatic tissue and serves no function in normal digestive processes.

Appendicitis is caused by inflammation of the appendix.

(Refer fig. 9)



Disclaimer

A good knowledge of this procedure will make the stress of undertaking the procedure easier for you to bear. The decision to proceed with the procedure is made because the advantages of the procedure outweigh the potential disadvantages. It is important that you are informed of these risks before the Procedure.

Although every effort is made to educate you on Gastro Intestinal System and take control, there will be specific information that will not be discussed. Talk to your doctor or health care provider about any concerns you have about this treatment.

YOUR SURGERY DATE

READ YOUR BOOK AND MATERIAL

VIEW YOUR VIDEO /CD / DVD / WEBSITE

PRE - HABILITATION

ARRANGE FOR BLOOD

MEDICAL CHECK UP

ADVANCE MEDICAL DIRECTIVE

PRE - ADMISSION TESTING

FAMILY SUPPORT REVIEW

Physician's Name : _____

Patient's Name : _____

Physician's Signature: _____

Patient's Signature: _____

Date : _____

Date : _____