

Digestive System: Facts, Function & Diseases

The human digestive system is a series of organs that converts food into essential nutrients that are absorbed into the body and eliminates unused waste material. It is essential to good health because if the digestive system shuts down, the body cannot be nourished or rid itself of waste.

Description of the digestive system

Also known as the gastrointestinal (GI) tract, the digestive system begins at the mouth, includes the esophagus, stomach, small intestine, large intestine (also known as the colon) and rectum, and ends at the anus. The entire system — from mouth to anus — is about 30 feet (9 meters) long, according to the [American Society of Gastrointestinal Endoscopy](#) (ASGE).

Digestion begins with the mouth. Even the smell of food can generate saliva, which is secreted by the salivary glands in the mouth, contains an enzyme, salivary amylase, which breaks down starch. Teeth, which are part of the skeletal system, play a key role in digestion. In carnivores, teeth are designed for killing and breaking down meat. Herbivores' teeth are made for grinding plants and other food to ease them through the digestion process.

[\[Image Gallery: The BioDigital Human\]](#)

Swallowing pushes chewed food into the esophagus, where it passes through the oropharynx and hypopharynx. At this point, food takes the form of a small round mass and digestion becomes involuntary. A series of muscular contractions, called peristalsis, transports food through the rest of the system. The esophagus empties into the stomach, according to the [National Institutes of Health](#) (NIH).

The stomach's gastric juice, which is primarily a mix of hydrochloric acid and pepsin, starts breaking down proteins and killing potentially harmful bacteria, according to ASGE. After an hour or two of this process, a thick semi-liquid paste, called chyme, forms.

At this point the pyloric sphincter valve opens and chyme enters the duodenum, where it mixes with digestive enzymes from the pancreas and acidic bile from the gall bladder, according to the [Cleveland Clinic](#). The next stop for the chyme is the small intestine, a 20-foot (6-meter) tube-shaped organ, where the majority of the absorption of nutrients occurs. The nutrients move into the bloodstream and are transported to the liver.

The liver creates glycogen from sugars and carbohydrates to give the body energy and converts dietary proteins into new proteins needed by the blood system. The liver also breaks down unwanted chemicals, such as alcohol, which is detoxified and passed from the body as waste, the Cleveland Clinic noted.

Whatever material is left goes into the large intestine. The function of the large intestine, which is about 5 feet long (1.5 meters), is primarily for storage and fermentation of indigestible matter. Also called the colon, it has four parts: the ascending colon, the transverse colon, the descending colon and the sigmoid colon. This is where water from the chyme is absorbed back into the body and feces are formed primarily from water (75 percent), dietary fiber and other waste products, according to the Cleveland Clinic. Feces are stored here until they are eliminated from the body through defecation.

Diseases of the digestive system

Many symptoms can signal problems with the GI tract, including: abdominal pain, blood in the stool, bloating, constipation, diarrhea, heartburn, incontinence, nausea and vomiting and difficulty swallowing, according to the NIH.

Among the most widely known diseases of the digestive system is [colon cancer](#). According to the Centers for Disease Control (CDC), 51,783 Americans died from colon cancer in 2011 (the most recent year for available data). Excluding skin cancers, colon and rectal cancer, or colorectal cancer, is the third most common cancer diagnosed in both men and women in the United States, according to the [American Cancer Society](#).

Polyp growth and irregular cells, which may or may not be cancerous, are the most common development paths for colorectal cancers (also referred to as CRC), and can be detected during a routine colonoscopy, according to Dr. John Marks, a gastroenterologist affiliated with the [Main Line Health](#) health care system.

“The best news is that, if caught early enough, they can also be removed during the colonoscopy — eliminating the possibility that they grow further and become cancer,” Marks said.


For those patients whose cancer has already spread, there are various minimally invasive surgical options that have extremely good prognoses. It is recommended that asymptomatic patients without a family history begin getting tested regularly between the ages 45 and 50, according to Marks. “Symptoms which may suggest that you need a colonoscopy at an earlier age include rectal bleeding and stool/bowel habit changes which last for more than a few days.”

While CRC gets a great deal of attention, many diseases and conditions of the digestive system — including [irritable bowel syndrome](#), diverticulitis, [GERD \(acid reflux\)](#) and [Crohn's disease](#) — can be chronic and are difficult to diagnose and treat, according to Dr. Larry Good, a gastroenterologist affiliated with [South Nassau Communities Hospital](#). “With many of these diseases, blood work and colonoscopies all looks normal, so there is an absence of red flags.”

Many of the diseases of the digestive system are tied to the foods we eat, and a number of sufferers can reduce their symptoms by restricting their diets, Good said. “Of course no one wants to hear that they can't eat certain foods, but many times, eliminating acidic things from the diet, such as tomatoes, onions, and red wine, can have an impact,” Good said.

There are a number of tests to detect digestive tract ailments. A colonoscopy is the examination of the inside of the colon using a long, flexible, fiber-optic viewing instrument called a colonoscope, according the [American Gastroenterological Association](#). Other testing procedures include upper GI endoscopy, capsule endoscopy, endoscopic retrograde cholangiopancreatography and endoscopic ultrasound.


Study of the digestive system

Gastroenterology is the branch of medicine  focused on studying and treating the digestive system disorders. Physicians practicing this specialty are called gastroenterologists. The name is a combination of three ancient Greek words *gastros* (stomach), *enteron* (intestine) and *logos* (reason). It is an internal medicine subspecialty certified by the [American Board of Internal Medicine](#).

To be certified as a gastroenterologist, a doctor must pass the Gastroenterology Certification Examination and undergo a minimum of 36 months of additional training.

Milestones

References to the digestive system can be traced back to the ancient Egyptians. Some milestones in the study of the gastrointestinal system include:

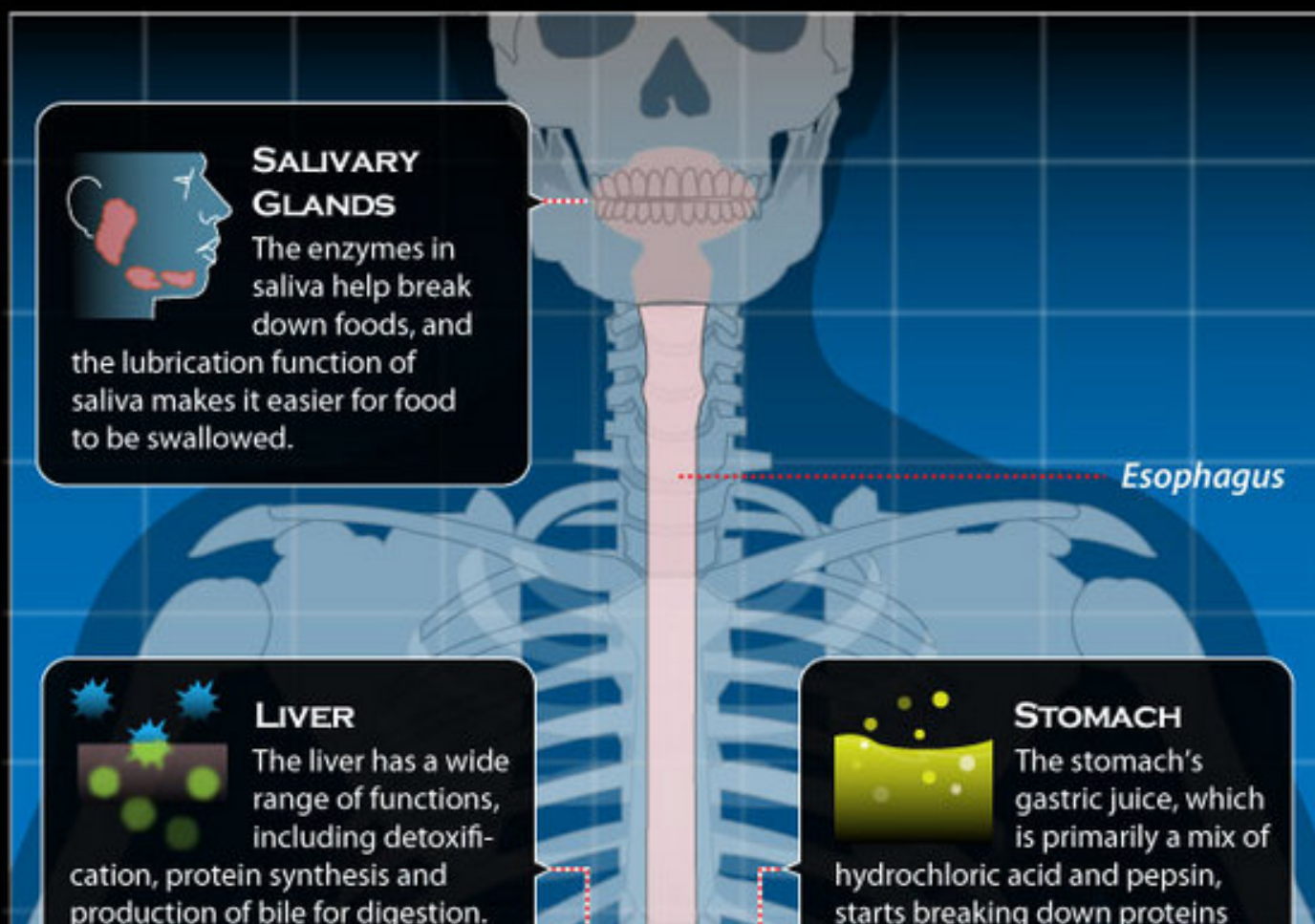
- Claudius Galen (circa 130-200) lived at the end of the ancient Greek period and reviewed the teachings of Hippocrates and other Greek doctors. He theorized that the stomach acted independently from other systems  in the body, almost with a separate brain. This was widely accepted until the 17th century.
- In 1780, Italian physician Lazzaro Spallanzani conducted experiments to prove the

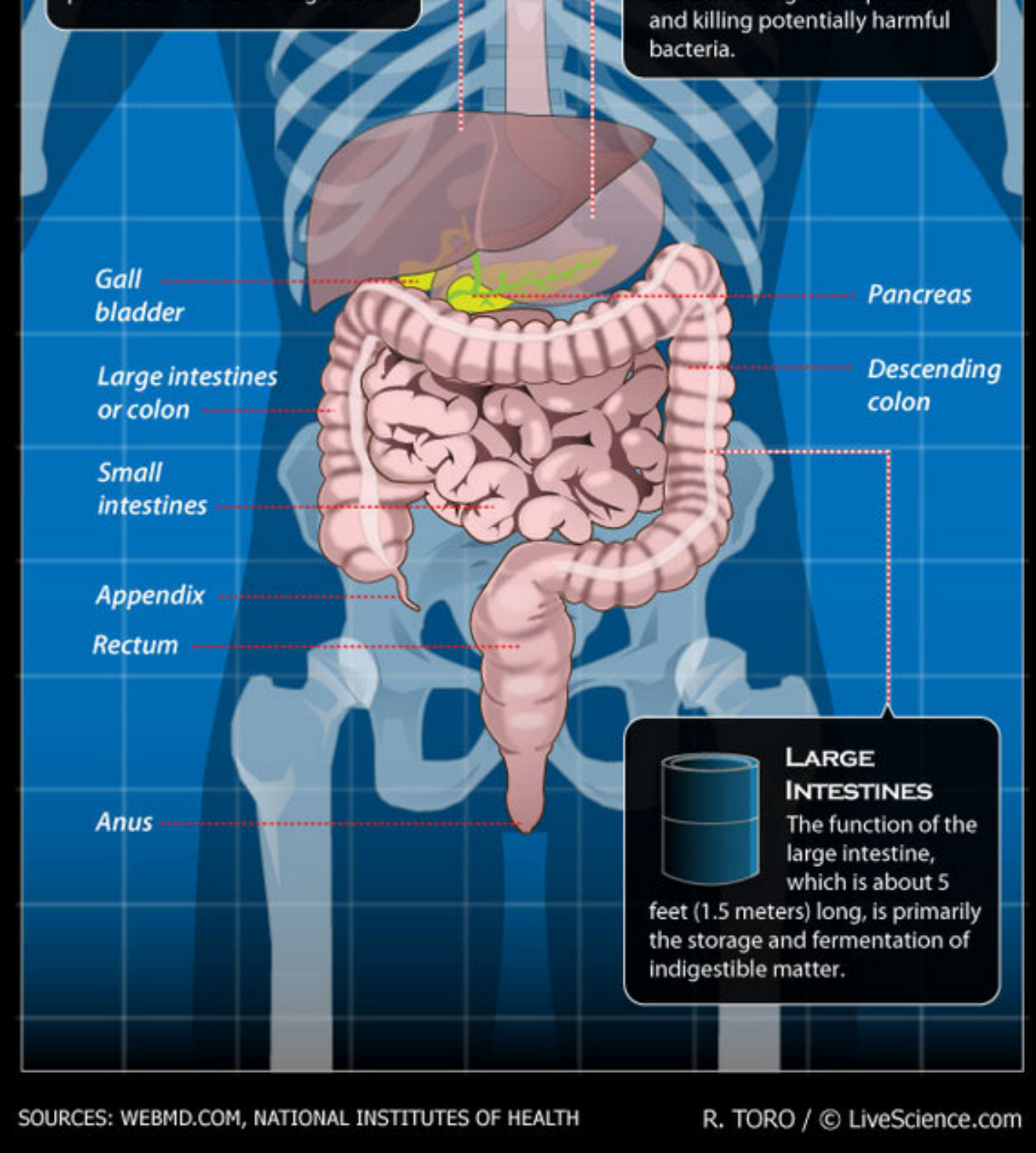
impact of gastric juice on the digestion process.

- Philipp Bozzini developed the Lichtleiter in 1805. This instrument, which was used to examine the urinary tract, rectum and pharynx, was the earliest endoscopy.
- Adolf Kussmaul, a German physician, developed the gastroscope in 1868, using a sword swallower to help develop the diagnostic process.
- Rudolph Schindler, known to some as the “father of gastroscopy,” described many of the diseases involving the human digestive system in his illustrated textbook issued during World War I. He and Georg Wolf developed a semi-flexible gastroscope in 1932.
- In 1970, Hiromi Shinya, a Japanese-born general surgeon, delivered the first report of a colonoscopy to the New York Surgical Society and in May 1971 presented his experiences to the American Society for Gastrointestinal Endoscopy.
- In 2005, Australians Barry Marshall and Robin Warren were awarded the Nobel Prize in Physiology or Medicine for their discovery of *Helicobacter pylori* and its role in peptic ulcer disease.

DIGESTIVE SYSTEM

The human digestive system is a series of organs that converts food into essential nutrients that are absorbed into the body. The digestive organs also move unused waste material out of the body.





Editor's Note: If you'd like more information [📖](#) on this topic, we recommend the following book:

Related pages

- [Human Body: Anatomy, Facts & Functions](#)

Systems of the human body

- [Circulatory System: Facts, Function & Diseases](#)
- [Endocrine System: Facts, Functions and Diseases](#)
- [Immune System: Diseases, Disorders & Function](#)
- [Lymphatic System: Facts, Functions & Diseases](#)

- [Muscular System: Facts, Functions & Diseases](#)
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- [Reproductive System: Facts, Functions and Diseases](#)
- [Respiratory System: Facts, Function & Diseases](#)
- [Skeletal System: Facts, Function & Diseases](#)
- [Skin: Facts, Diseases & Conditions](#)
- [Urinary System: Facts, Functions & Diseases](#)

Parts of the human body

- [Bladder: Facts, Function & Disease](#)
- [Human Brain: Facts, Anatomy & Mapping Project](#)
- [Colon \(Large Intestine\): Facts, Function & Diseases](#)
- [Ears: Facts, Function & Disease](#)
- [Esophagus: Facts, Function & Diseases](#)
- [How the Human Eye Works](#)
- [Gallbladder: Function, Problems & Healthy Diet](#)
- [Human Heart: Anatomy, Function & Facts](#)
- [Kidneys: Facts, Function & Diseases](#)
- [Liver: Function, Failure & Disease](#)
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- [Nose: Facts, Function & Diseases](#)
- [Pancreas: Function, Location & Diseases](#)
- [Small Intestine: Function, Length & Problems](#)
- [Spleen: Function, Location & Problems](#)
- [Stomach: Facts, Function & Diseases](#)
- [The Tongue: Facts, Function & Diseases](#)