

Marta Czarnocka

**THE DIGESTIVE SYSTEM AND DIGESTION**

**A textbook for students of dietetics**

DOI: 10.34739/9788367162005

Siedlce University of Natural Sciences and Humanities

2021

### **Author of the monograph**

Marta Czarnocka [0000-0003-2535-4246]

Siedlce University of Natural Sciences and Humanities  
The Centre for Foreign Languages

### **Reviewer**

dr Magdalena Chudak

Katolicki Uniwersytet Lubelski Jana Pawła II

### **Editorial Committee**

Katarzyna Antosik, Andrzej Barczak, Jolanta Brodowska-Szewczuk, Janina Florczykiewicz (przewodnicząca), Arkadiusz Indraszczyk, Beata Jakubik, Stanisław Jarmoszko, Bartosz Michalczuk, Katarzyna Mroczyńska, Agnieszka Prusińska, Sławomir Sobieraj, Jacek Sosnowski, Maria Starnawska, Ewa Wójcik

© Copyright by Siedlce University of Natural Sciences and Humanities, Siedlce 2021

No part of this publication may be reproduced, placed in a retrieval system or transmitted in any form – electronic, mechanical, photocopying or other reproduction without permission of the copyright holder.

ISBN 978-83-67162-00-5



Wydawnictwo  
Naukowe UPH

**Wydawnictwo Naukowe  
Uniwersytetu Przyrodniczo-Humanistycznego w Siedlcach**

[www.wydawnictwo-naukowe.uph.edu.pl](http://www.wydawnictwo-naukowe.uph.edu.pl)

08-110 Siedlce, ul. Żytnia 17/19, tel. 25 643 15 20

## TABLE OF CONTENTS

---

Chapter 1. INTRODUCTION TO THE DIGESTIVE SYSTEM & DIGESTION .....	4
Chapter 2. ORAL CAVITY .....	8
Chapter 3. THE PATH TO THE STOMACH .....	14
Chapter 4. STOMACH .....	19
Chapter 5. LIVER .....	22
Chapter 6. PANCREAS .....	27
Chapter 7. SMALL INTESTINE .....	32
Chapter 8. LARGE INTESTINE .....	42
BIBLIOGRAPHY .....	39

## INTRODUCTION TO THE DIGESTIVE SYSTEM & DIGESTION

---

In this chapter you will learn the language related to:

- the function of the digestive /daɪ'dʒestɪv/ system,
- organs the digestive system is comprised of,
- some basic facts about the process of digestion /daɪ'dʒestʃən/.

### 1. Work in pairs. Discuss the questions.

What is the function of the digestive system?

Name five organs that come into contact with food.

What are some common digestive disorders?

## DIGESTIVE SYSTEM

### 2. Read the text.

The body needs energy to work properly. You need energy to move, study and laugh. Sugars, protein and fat in the foods you eat help your body **obtain energy**. The role of the **digestive system** is to take in food, **break it down into** small molecules /'mɒlɪkjʊ:l/, and put those molecules into the **bloodstream** to carry energy to all cells of the body. Cells use as much of the food energy as they need, and the rest either is stored as fat or eliminated (leaves the body).

The digestive system **is comprised of** the organs of the **digestive tract** (the path along which food travels) and **accessory** /ək'sesəri/ **organs**, which help with digestion but are not part of the path of food. In this term, you will learn how food travels through the digestive tract and how the digestive process is controlled.

### 3. Look at the words in bold and guess their meaning. Are there any other words in the text you do not know? If yes, check their meaning in the dictionary.

### 4. Read the text again. Make the questions to these answers.

1. \_\_\_\_\_

To work properly, move, study, laugh.

2. \_\_\_\_\_

To take in food, break it down into small molecules, and put those molecules into the bloodstream to carry energy to all cells of the body.

3. \_\_\_\_\_

As much as they need.

4. \_\_\_\_\_

It is either stored as fat or eliminated (leaves the body).

5. \_\_\_\_\_

The organs of the digestive tract and accessory organs.

6. \_\_\_\_\_

They help with digestion but are not part of the path of food.

**5. Put the sentences in the correct order to make a paragraph about digestion.  
Use a dictionary to help you with the words you do not know.**

## DIGESTION

**Digestion begins in the mouth cavity.**

..... Food digestion is completed and the small intestine with the help of several digestive juices.

..... In the mouth cavity food is chewed into small pieces by the teeth and mixed with saliva.

..... In the stomach the gastric glands produce gastric juice that contains pepsin.

..... The bolus /'bɒləs/ moves along the oesophagus and enters the stomach.

..... The food is rolled into a bolus by the tongue and swallowed.

..... The partly digested food is then released into the small intestine.

..... The pepsin helps break down proteins in the food into peptides.

..... The salivary amylase /sə'laɪvəri 'æmɪleɪz/ in the saliva helps break down starch into maltose.

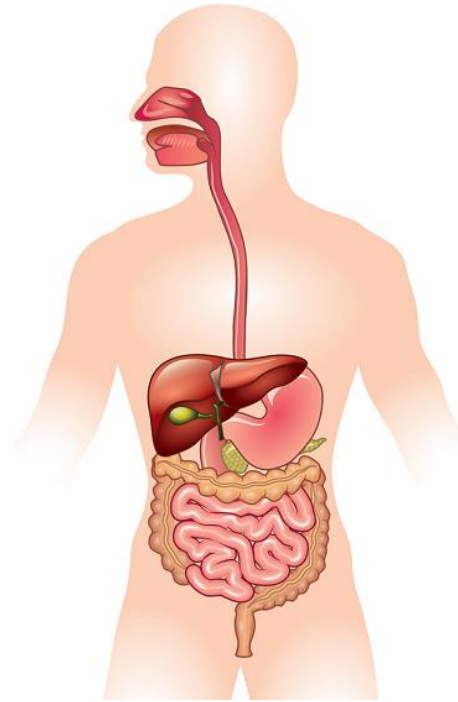
..... They include the bile produced by the liver, the pancreatic /,pæŋkri'ætɪk/ juice produced by the pancreas /'pæŋkriəs/, and the intestinal juice produced by some glands in the wall of the small intestine.

..... Under the action of different enzymes in the digestive juices and on the intestinal wall disaccharides have broken down into monosaccharides, proteins into peptides or amino acids, lipids into glycerol /'glɪsərol/ and fatty acids.

**Now listen or watch the video to check your answers.** <https://youtu.be/Q72559sVDa4>

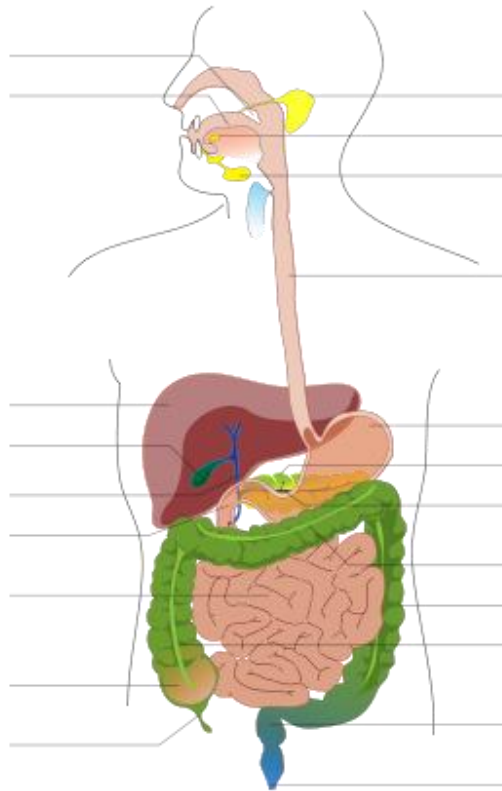
6. Look at this diagram of the digestive system. Label the parts with the words below. Underline the organs of the digestive tract and circle the accessory organs.

large intestine  
liver  
oesophagus  
oral cavity / mouth cavity  
pancreas  
pharynx  
small intestine  
salivary glands  
stomach



7. Look at the diagram of the digestive system and write the words and sentences below in the correct places on the diagram. Use a dictionary to help you with the words you do not know.

anus	Epiglottis closes entrance to trachea when food is being swallowed.
appendix	Large intestine removes water from undigested food.
caecum	Salivary gland produces saliva.
pancreas	Small intestine digests and absorbs food.
duodenum	Stomach mixes food with gastric juice.
rectum	Teeth cut and grind food.
ileum	Tongue mixes food with saliva.
liver produces bile	Gall bladder stores bile.
oesophagus	
trachea	



**8. Watch the video.** The inside of the human digestive tract is shown in this 3D, computer-generated animation. It starts at the beginning of the oesophagus and ends at the anus. Enjoy!

<https://youtu.be/-1aZj6v6dxc>

## ORAL CAVITY

---

In this chapter you will learn the language related to:

- the contents of the oral cavity,
- saliva and salivary glands,
- tongue and taste buds,
- human teeth and cavity.

The upper digestive tract is the region extending from the mouth (oral cavity) to the stomach. It includes the oral cavity (or buccal cavity) and its contents (teeth, tongue, salivary glands), the pharynx, the oesophagus and the stomach.

### 1. Work in pairs. Discuss the questions.

What are the functions of saliva?

What are the five basic flavours that stimulate taste buds?

How many teeth should an adult human have? Can you name the four types of them?

What causes cavities? What can you do to prevent cavities?

### SALIVA & SALIVARY GLANDS

/sə'laɪvə/ /sə'laɪvəri glændz/

### 2. Read the text.

The sight, smell, taste and thought of food stimulates the production of *saliva* – a watery liquid in the mouth. Saliva is made by six (three pairs) sac-like organs called *salivary glands*. There are three major types of them:

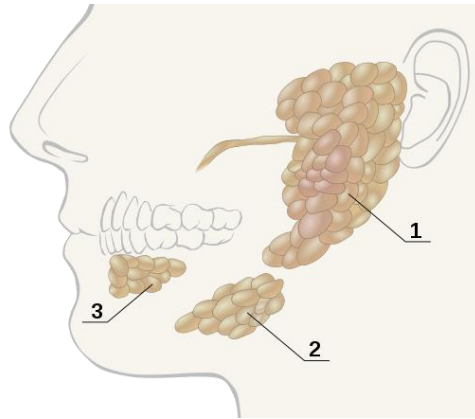
- *sublingual* (located at the base of the tongue),
- *submandibular* or *submaxillary* (located on the sides of the mouth, below the mandible),
- *parotid* (located between the mouth and ear).

The salivary glands secrete *saliva* which contains *bicarbonate ions* /,baɪ'kɑ:bənət 'aɪənz/, *mucus* /'mju:kəs/, *salivary amylase*, *lingual lipase* /'laɪpeɪz/, *lysosomes*. The saliva has three functions. First, it helps to kill bacteria in the mouth. Second, it contains molecules that begin to digest starch found in foods such as rice, bread or potatoes. The digestion of starch must begin in the mouth because starch molecules are quite large. Third, saliva liquefies food, dissolving food molecules. When food molecules are dissolved, we are able to taste food.



3. Label the salivary glands on the diagram. What are their Polish equivalents?

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_



4. Saliva contains *bicarbonate ions, mucus, salivary amylase, lingual lipase, lysozyme*.

Which one:

- protects against abrasions /ə'breɪʒnz/ \_\_\_\_\_
- makes saliva alkaline \_\_\_\_\_
- breaks down fat \_\_\_\_\_
- breaks down starch \_\_\_\_\_
- kills bacteria \_\_\_\_\_
- lubricates the food? \_\_\_\_\_

Watch the video and check your answers. <https://youtu.be/i5OOVXI0yAI>

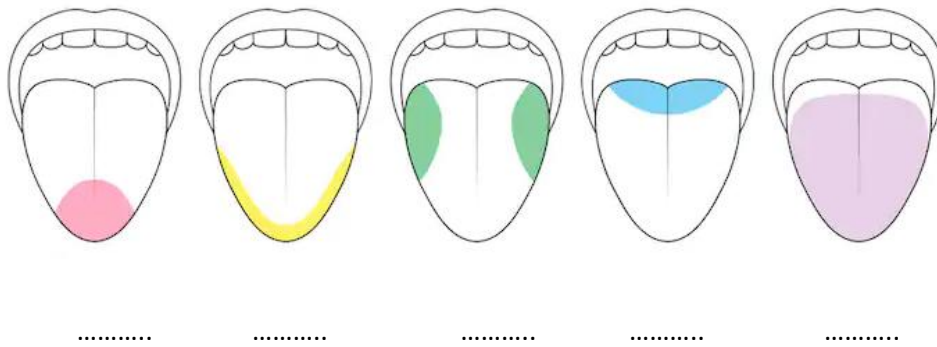
**TONGUE & TASTE BUDS**

5. Read the text.

The tongue is a fleshy muscular organ which is attached at the back of the floor of the buccal cavity. It helps in mixing saliva with food during chewing, which is essential for the digestion of food, and swallowing the food into the food pipe. The tongue also enables you to taste food.

Different foods have different tastes. You can taste your food because of the tiny bumps on your tongue. These bumps contain *taste buds*. Each taste bud is stimulated by one of the five basic flavours: *sweet, sour, salty, umami* /u:'ma:mi/ (a taste like beef or chicken) and *bitter*. Different regions of the tongue have concentrations of different taste buds.

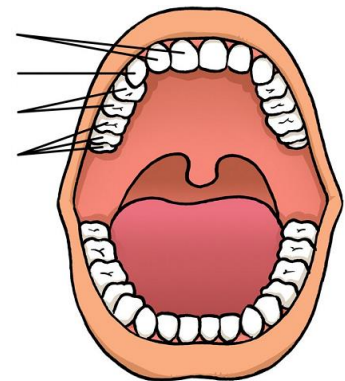
6. Label the basic flavours on the diagram.



TEETH

7. Read the text.

Along with the muscles of the mouth, the tongue also moves the food as you chew it with your teeth. Chewing breaks the large pieces of food into smaller ones so that the food can be easily swallowed. Humans have 32 teeth as adults. There are four different types of them: *incisors* /ɪn'saɪzə(r)z/, *canines* /'keɪnəɪn/, *molars*, *premolars*. Label them on the diagrams. What are their names in Polish?



8. You are going to watch the video about teeth. Before you watch, think and try to guess what these numbers refer to.

- 32 .....
- 20 .....
- 6 .....
- 10 .....
- 17 to 25 .....

Then watch and check. <https://youtu.be/ZE-TtFhZIDw>

**9. Watch the video and complete the sentences.** <https://youtu.be/wVF-iVgEzYY>

Teeth are made from ..... such as collagen /'kɒlədʒən/, and ..... such as calcium.

Permanent teeth are also called ..... teeth.

Canines are also called .....

Premolars are also called .....

Wisdom teeth are also called ..... molars.

Baby molar teeth are replaced by adult .....

Sometimes the wisdom teeth are ..... which means that they are stuck under the gums as they have no enough space to grow.

**10. There are different types of permanent teeth in our mouth. Each one has its own function.**

**Write I for incisors, C for canines, M for molars, P for premolars.**

\_\_\_\_\_ The last ones that are in the very back on each side are sometimes called wisdom teeth.

\_\_\_\_\_ They have sharp edges that help us bite into food.

\_\_\_\_\_ They are located at the front of the mouth.

\_\_\_\_\_ There are twelve of them, six in the upper jaw and six in the lower jaw.

\_\_\_\_\_ They are used for grinding food.

\_\_\_\_\_ There are eight of them, four in the upper jaw and four in the lower jaw.

\_\_\_\_\_ They are the biggest in number.

\_\_\_\_\_ They are located next to canines.

\_\_\_\_\_ There are four of them, two in the upper jaw and two in the lower jaw.

\_\_\_\_\_ They are used for cutting and grinding.

\_\_\_\_\_ They are the very first teeth to grow.

\_\_\_\_\_ They are fang-like teeth that are to the side of the incisors.

\_\_\_\_\_ They are used for chewing and grinding food.

\_\_\_\_\_ They are used for tearing food.

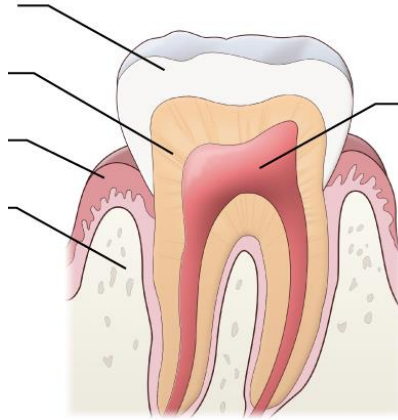
\_\_\_\_\_ There are eight of them, four in the upper jaw and four in the lower jaw.

\_\_\_\_\_ They have a flat surface with ridges.

\_\_\_\_\_ They are the last set of teeth to come in.

\_\_\_\_\_ They are located at the very back of the mouth.

11. Each tooth has three main layers: *dentine* /'denti:n/, *enamel*/ɪ'næml/, *pulp*. Label them on the diagram. What are the other two left?



12. Read the sentences. Are the words in *italics* true (T) or false (F)? Correct the false ones.

..... *Enamel* is the outer layer of a tooth.

..... *Dentine* lies beneath the enamel.

..... *Pulp* comprises the largest part of the tooth.

..... *Dentine* is the most inner area of a tooth.

..... *Dentine* is a hard, protective coating.

..... *Pulp* is the only area of a tooth that contains living cells.

..... The tooth's nerve and blood supply is located in *the pulp*.

..... If you have a toothache, the pain you feel is the result of sensory receptors in *the dentine*.

The sensory receptors send messages about pain to the brain.

..... *Pulp* is made of calcium salts and proteins.

13. Read the text. Write questions to the underlined parts of the text.

A cavity is (1) a hole or opening. Cavities occur (2) when teeth are not brushed frequently. Bacteria that live in the mouth use (3) the sugars that accumulate on the teeth to make acid. The acid (4) 'eats away' the enamel on the outside of a tooth and the calcium salts in the dentine beneath the enamel. Bacteria can then digest (5) the protein in the dentine. This results in a hole. (6) If the bacteria reach the nerves inside the pulp, the cavity becomes painful. A dentist can fix cavity (7) by filling the hole. The best way to avoid cavities is (8) to brush and floss teeth after each meal to keep the sugars away from the bacteria that live in your mouth.

Q1: \_\_\_\_\_

Q2: \_\_\_\_\_

Q3: \_\_\_\_\_

Q4: \_\_\_\_\_

Q5: \_\_\_\_\_

Q6: \_\_\_\_\_

Q7: \_\_\_\_\_

Q8: \_\_\_\_\_

**14. Watch the video *What causes cavities?*.** When a team of archaeologists recently came across some 15,000-year-old human remains, they made an interesting discovery: the teeth of those ancient humans were riddled with holes. Watch the video and find out what causes cavities and how we can avoid them.

*<https://ed.ted.com/lessons/what-causes-cavities-mel-rosenberg>*

**15. Watch the video. Decide if the sentences are true (T) or false (F). Correct the false information.**

*<https://ed.ted.com/lessons/what-causes-bad-breath-mel-rosenberg>*

..... Another name for bad breath is halitosis.

..... Bad breath comes mainly from the stomach.

..... Bacteria cause the smells by breaking down sugar.

..... People who have bad breath can smell it themselves.

..... Bad breath improves when you breathe in through the nose.

..... The best way to find out if you have bad breath is to ask a friend.

**EXTRA VIDEO!**

Watch it in your free time and enjoy!

The evolution of teeth *<https://ed.ted.com/lessons/how-did-teeth-evolve-peter-s-ungar>*

## THE PATH TO THE STOMACH

---

In this chapter you will learn the language related to:

- the upper part of the digestive tract,
- choking,
- abdominal thrusts,
- heartburn.

### 1. Work in pairs. Discuss the questions.

What is the job of the *epiglottis* /,epɪ'glɒtɪs/?

Where does the *trachea* /trə'ki:ə/ go? What does it carry?

Where does the *oesophagus* /i'sɒfəgəs/ go? What does it carry?

What is another word for *cough reflex*?

How does food move down the *oesophagus*?

What kind of tissue comprises the *gastroesophageal sphincter*/'sfɪŋktə(r)/?

### 2. Watch the video to see how the larynx, oesophagus, and epiglottis are positioned when breathing and swallowing. <https://youtu.be/FuWOXkYr274> (Function of epiglottis)

### 3. Read the text about the upper part of the digestive system. Complete it with the missing words: *epiglottis, larynx, oesophagus, pharynx, trachea*

After food is chewed, it is swallowed. To swallow, the tongue pushes the food to the back of the mouth and into the ....., commonly called the *throat*. At the end of it there are two tubes.

One tube consists of the ....., also called the *voice box*. It connects to the ....., which is the path of air to the lungs. When you breathe, the air goes into your lungs and trachea.

The other tube at the end of the pharynx is the ....., a long muscular tube that leads to the stomach. When you swallow, food moves first into the pharynx, then into the oesophagus, and then down to the stomach. When you swallow, you want food to enter the oesophagus, not the larynx. The ..... covers the larynx when you swallow to prevent food from entering the trachea.

### 4. And now watch the endoscopic removal of fishbone in the epiglottis.

<https://youtu.be/HCCSIdyOSCM>

## CHOKING

### 5. Read the text. In pairs, tell your friend what happens when choking occurs.

If food enters the larynx and trachea, a **cough reflex** called **choking** occurs. You choke when sensory receptors on the walls of the larynx and trachea sense that something is there that shouldn't be there. Food can enter your trachea if someone makes you laugh or scares you after you have begun to swallow. If you breathe in air at the same time you are swallowing, this causes epiglottis to open, and the food may enter the larynx instead of the oesophagus, causing the *cough reflex*, or *choking*, to occur. People sometimes say "the food went down the wrong tube". Muscles in the walls of the trachea and larynx usually push the food back up into the mouth where it can then be swallowed down the oesophagus.

### 6. Watch the video on what happens when you swallow something "down the wrong pipe".

<https://youtu.be/RYsz2Od5jDQ>. Answer the questions.

What is *aspiration*?

---

Why do you cough when something goes down your trachea?

---

When does your epiglottis fail to close?

---

What is the wrong pipe? What is the right pipe?

---

What can occur when food or liquid enters your lungs?

---

What is the best way to avoid choking?

---

What should you do if choking persists?

---

### 7. Read the text about abdominal thrusts /æb'dɒmɪnl θrʌsts/ and do the task below.

The method used to help a choking person is called the Heimlich maneuver or abdominal thrusts.

Abdominal thrusts is an emergency technique to help clear someone's airway. The procedure is done on someone who is choking and also conscious. For unconscious victims, chest thrusts are recommended.

Most experts do not recommend abdominal thrusts for infants less than 1 year old. You can also perform the manoeuvre yourself.

**Put the steps in the correct order:**

To carry out an abdominal thrust:

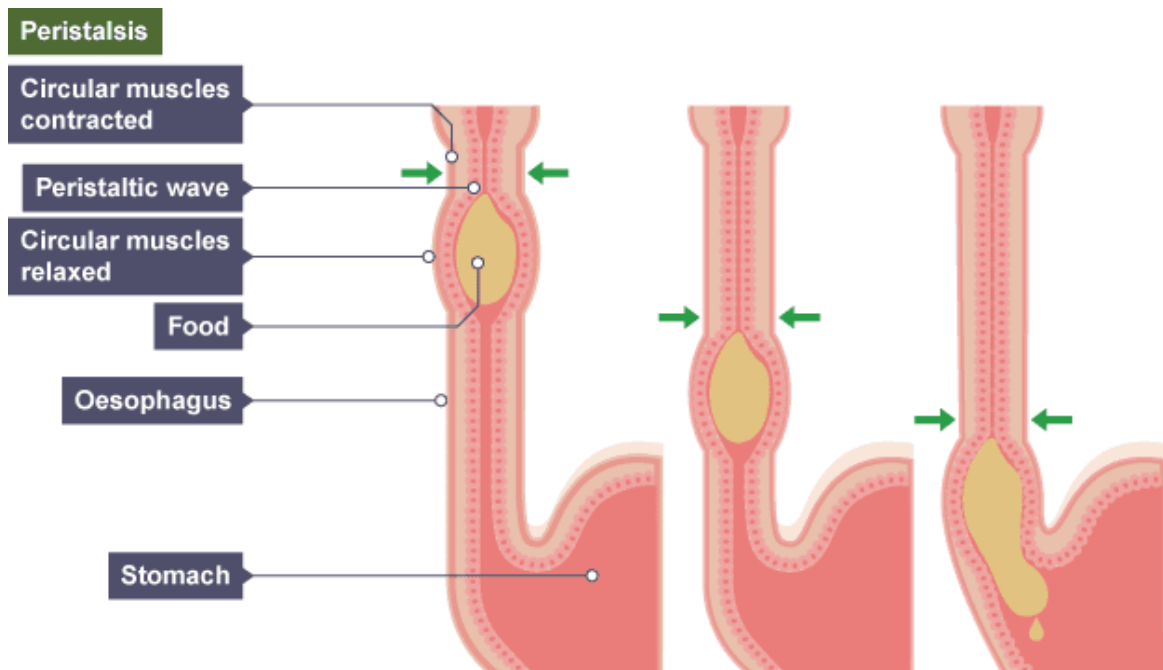
- ..... Clench one fist and place it right above the person's belly button.
- ..... Repeat this movement up to 5 times.
- ..... Stand behind the person who's choking.
- ..... Put the other hand on top of your fist and pull sharply inwards and upwards.
- ..... Place your arms around their waist and bend them forward.

Watch the video and check your answers. <https://youtu.be/tEliEAn7b-U>

**OESOPHAGUS**

**8. Read the text. In pairs, tell your friend what happens when food enters the oesophagus.**

Let's turn now to what happens when food enters the **oesophagus**. The oesophagus has muscle tissue around it. When the oesophagus senses food at the top, the muscle tissue begins to contract. The contractions move in waves from the top of the oesophagus to the bottom. These waves of contractions are called **peristalsis** /ˌpɛrɪˈstælsɪs/. Peristalsis squeezes the food down the oesophagus to your stomach. Analyse the diagram below.





At the end of the oesophagus, there is a small ring of smooth muscle which relaxes to allow food to enter the stomach. The ring of muscle is called the **lower oesophageal sphincter (LES)**. Show it on the diagram. After the food is in the stomach, the oesophageal sphincter closes to prevent food from being pushed upward into the oesophagus.

**9. Read the text and complete it with capital letters and punctuation marks (full stops, commas, hyphens). Watch the video and check.** <https://youtu.be/rJS-Kh5wCQU>.

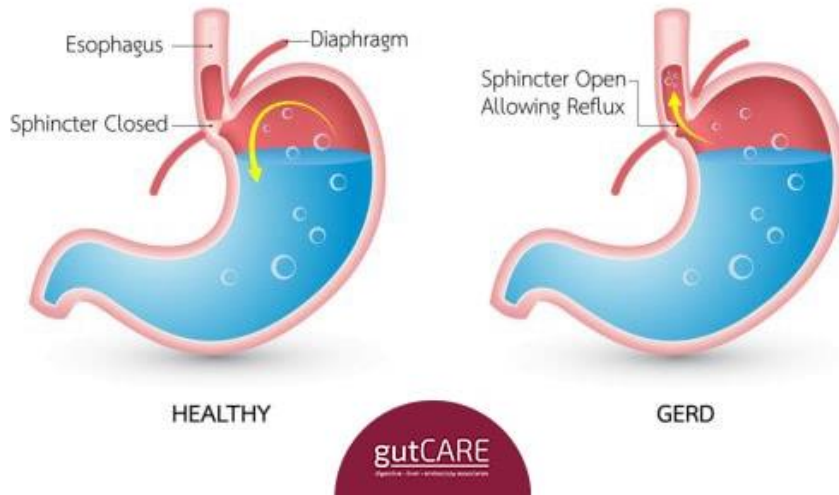
When food is swallowed it moves down a tube called the oesophagus that connects your mouth to your stomach the oesophagus lies right next to another tube the trachea that takes the air you breathe to your lungs you might choke if food got into the trachea but fortunately the body has a safety device that usually prevents this from happening the opening to the trachea is guarded by a flap of tissue called the epiglottis that acts like a trapdoor when you swallow the epiglottis slams shut to prevent food from going down the trachea the journey of food through the oesophagus is a short one lasting only several seconds but food doesn't just fall down the oesophagus in fact even if we chose to eat and swallow upside down food would still quickly make its way up to the stomach the reason is that food is propelled through the oesophagus as well as the other parts of the digestive tract by a series of muscular contractions called peristalsis peristalsis works a little like a tube of toothpaste squeezing the tube forces the paste out food moves through the digestive tract in much the same way muscles behind the food squeeze together while muscles in front of the food relax in this way peristalsis forces food through the oesophagus and other parts of the digestive tract.

## HEARTBURN

**10. Read the text. In pairs, tell your friend what happens when heartburn occurs.**

If you lie down shortly after eating a big meal or if the gastroesophageal sphincter doesn't close completely, the acid from the stomach can move back into the oesophagus. This causes inflammation (a burning feeling) in the lining of the oesophagus in the area called the **gastroesophageal junction**. This inflammation is commonly known as **heartburn**. When the symptoms of heartburn become more regular and intense, such as twice a week or more, it is diagnosed as **gastroesophageal reflux disease (GERD)**.

GASTROESOPHAGEAL REFLUX DISEASE



**11. Watch the video. Answer the questions.**

<https://ed.ted.com/lessons/what-causes-heartburn-rusha-modi>

What are the causes of heartburn?

- a) \_\_\_\_\_
- b) \_\_\_\_\_
- c) \_\_\_\_\_
- d) \_\_\_\_\_
- e) \_\_\_\_\_
- f) \_\_\_\_\_

What may constant heartburn lead to?

- a) \_\_\_\_\_
- b) \_\_\_\_\_

How can ongoing reflux be treated?

- a) \_\_\_\_\_
- b) \_\_\_\_\_

How can we prevent heartburn?

- a) \_\_\_\_\_
- b) \_\_\_\_\_
- c) \_\_\_\_\_

## STOMACH

---

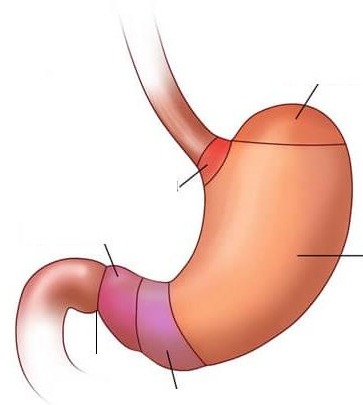
In this chapter you will learn the language related to:

- different parts of the stomach,
- digestion in the stomach,
- pyloric stenosis,
- peptic ulcers.

**1. Complete the gaps with the Polish meaning of the words. Label the diagram with the stomach parts in *italics*.**

The stomach is a muscular sac. Some of the main parts of the stomach are:

- *cardia* (PL .....)
- *fundus* (PL .....)
- *body* (PL .....)
- pyloric region (PL .....), which includes:
  - *pyloric antrum* (PL .....)
  - *pyloric canal* (PL .....)
- *pylorus* (PL .....) and *pyloric sphincter* (PL .....).



**2. Read the text about the digestion in the stomach. Six extracts have been removed from the text. Choose from the options a) – g) the one which fits each gap. There is one extra option which you don't need to use.**

Protein digestion begins in the stomach with the help of *enzymes* made by the stomach. Enzymes are molecules that help chemical reactions to go faster. .... . Smaller molecules are able to move more easily into the bloodstream when they reach the small intestine. Although some protein digestion occurs in the stomach, .... . The stomach wall has three layers. This muscle is arranged so that when it contracts, the food in the stomach is squeezed in all directions. .... . You add soap and water to the shirt and squeeze it in all directions. That's just what your stomach does to food. Its muscles contract in different directions, .... . When this mixing is completed, the food and juices have become a thick liquid, like a milkshake. When the small intestine is ready to receive food from the stomach, another ring of smooth muscle connecting the stomach and small intestine relaxes. .... . It allows only small amounts of food to enter the small intestine at a time so that .....

- a) allowing the stomach juices to mix well with the food.
- b) This is a muscle that acts as a valve closing the top of the stomach.
- c) the small intestine can fully digest the food and absorb the nutrients.
- d) This ring of muscle is called the *pyloric sphincter*.
- e) Imagine that you are washing a shirt by hand.
- f) most digestion of food occurs in the small intestine.
- g) These enzymes help to break down protein molecules into smaller molecules.

**3. Read the text about what exactly happens in our stomachs when we eat and complete the gaps with missing words.**

*adaptable, cardia, churn, contractions, digestion, eliminates, empties, expands, fundus, gastric acid, gastric juice, impulses, muscle, pylorus, secretions*

Even before we've taken the first bite of a meal, the brain sends ..... to the stomach. These impulses start the production of ..... in the stomach and the upper part of the stomach, which acts as a reservoir, expands. The food passes into the stomach through the ..... at the stomach entrance. This is a ..... that acts as a valve closing the top of the stomach. The top part of the stomach, the ....., is where food and the air that we swallow with every bite is collected. This is where the stomach volume starts to adapt. The *fundus* is an extremely ..... structure. The more food goes into the stomach, the more it ..... In the middle part of the stomach, called the *body*, ..... is produced and mixed with the mass of chewed food. The main component of gastric juice is ..... . This ..... bacteria in the food and also helps to prepare the food for the following stages of ..... . The muscular ..... of the stomach wall ..... the food mass and mix it with gastric juice. Three contractions per minute move the food mass back and forth. After a certain time, the contents of the stomach are adequately broken down and mixed and passed in small quantities into the intestine via the ..... . As the stomach ..... , it gradually returns to its previous size.

**Watch the video and check you answers.** <https://youtu.be/ZuJzYYIS9c4>

**4. Watch the video about a *pyloric stenosis* (PL .....) from the start to 02:00.**

**Answer the questions.** <https://youtu.be/hvfye6nokpQ>

- a) What happens when the brain sends impulses to the stomach?  
.....
- b) What is the muscle that closes the top of the stomach called?  
.....

c) Which section of the stomach is the most adaptable and why?

.....

d) Where is gastric juice produced? What is its main component and what is its role?

.....

e) How does a pyloric sphincter act when a child is healthy?

.....

f) How does a pyloric sphincter act when a child develops a pyloric stenosis?

.....

**5. Read the text about peptic ulcers. Use the words in capital letters given at the end of some of the lines to form a word that fits in the gap in the same line.**

### PEPTIC ULCERS

Inside the stomach, food is further ..... by acid secreted by tiny glands in the stomach walls. The acid is strong and can “eat away” almost anything: meat, carrots, cake, and any other kind of food. Because stomach acid is strong, it can hurt the stomach. To protect itself from ....., the stomach lining contains cells that constantly produce ..... mucus. It is the opposite of acid. Alkaline mucus neutralizes acid, making it less ..... to the stomach lining. This mucus basically coats the stomach lining to prevent acid from “eating” it.

LIQUID

DANGEROUS

ALKALI

HARM

*Lesions* /'li:ʒən/, or *sores*, in the wall of the stomach are called *peptic ulcers* /peptɪk 'ʌlsə/.

People used to believe that peptic ulcers were caused by stress, too much acid, or eating spicy food. We now know that these lesions are actually caused by a ..... *Helicobacter pylori* that lives in the stomach. It causes certain areas of the stomach wall to become irritated. This ..... leads to ..... of more acid than normal and increases the damage to the stomach wall. Peptic ulcers feel like someone pouring vinegar onto an open wound. Peptic ulcers are now successfully treated with antibiotics that kill the bacteria. Medicines can also be given to decrease the amount of acid present in the stomach.

BACTERIA

IRRITATE

SECRETE

**EXTRA VIDEOS! Watch these videos in your free time and enjoy!**

Stomach ulcers video <https://youtu.be/SWMWsOXIBwE>

The surprising cause of stomach ulcers.

<https://ed.ted.com/lessons/the-surprising-cause-of-stomach-ulcers-rusha-modi>

Peptic ulcer disease - causes, symptoms, diagnosis, treatment, pathology

<https://www.youtube.com/watch?v=EOIBMWQDEH4>

– Chapter 5 –

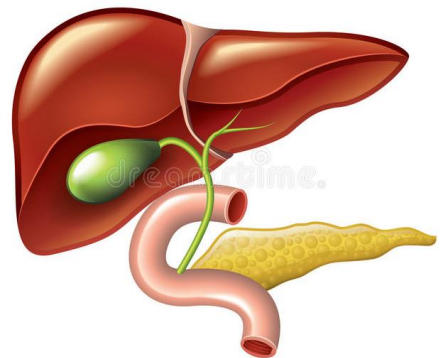
## LIVER

In this chapter you will learn the language related to:

- the functions of the liver,
- the warning signs of liver damage,
- a gall bladder and gallstones.

After the food leaves your stomach, it goes to the small intestine. Most digestion takes place in the small intestine with the help of accessory organs. Your body needs extra organs to help with digestion, but food doesn't go to these organs. Instead, these organs send molecules to the small intestine to aid in the digestion of certain food molecules.

What are these accessory structures? **Label them on the diagram.**



## LIVER

The liver is a large brown organ that lies under the diaphragm and on top of the stomach. The liver performs many different functions. Do you know what they are?

**1. Watch the video and list the eight functions of the liver. Watch again and make some notes about each function.** <https://youtu.be/vw5qjJgGVKo>

- a) .....
- b) .....
- c) .....
- d) .....
- e) .....
- f) .....

**2. Watch the video. What are the 6 early warning signs of liver damage?**

<https://youtu.be/i7G30doBHE0>

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_

- 3. \_\_\_\_\_
- 4. \_\_\_\_\_
- 5. \_\_\_\_\_
- 6. \_\_\_\_\_

**What are other complications which can occur as a result of liver damage?**

**3. Match symptoms 1–6 from exercise 2 to the paragraphs below.**

.....

One of the signs of liver damage is if you begin to experience confusion. A damaged liver can allow too much copper to build up in the blood and brain. This can lead to Alzheimer's -like symptoms. If you're experiencing this, chances are it's not the only symptom you've experienced. Confusion is associated with advanced stage liver disease. Do you experience any of these warning signs? Keep watching for some even more serious warning signs that your liver may be damaged.

.....

Damaged liver causes your skin or eyes to become yellow because it allows bilirubin, a yellow compound, into your blood. If your liver is healthy, it will be able to dispose of the bilirubin. Jaundice is caused by high levels of bilirubin in the blood. Bilirubin is responsible for the destruction and natural breakdown of red blood cells in the body. Jaundice, which occurs due to liver damage, occurs when the liver is unable to metabolize and excrete bilirubin. There are many different signs and symptoms associated with jaundice. Apart from the yellow discoloration of the skin, other symptoms of jaundice include light-colored stools, itchy skin, dark colored urine, and more.

.....

They are one common sign of liver damage. You'll feel swelling or pain in the upper right quadrant of your abdomen. The reason it'll be the right side is that the far end of the liver is on the right side. Abdominal pain associated with liver damage is usually located underneath the ribs. The abdomen may also swell and the person experiencing the liver damage may also experience flu-like symptoms like fatigue, vomiting, muscle and/or joint pain, nausea, fever and more. If you begin to experience unusual liver pain, you should visit the emergency room or consult with your doctor to rule out the possibility of liver damage.

.....

Vomiting, joint pain, fatigue and loss of appetite are all interrelated symptoms of liver disease, mainly autoimmune hepatitis. This is a condition where your immune system attacks the cell tissues in your liver. According to the National Institutes of Health, this condition is more common in women than men.

.....

If your liver is not cleaning the blood in your body, clotting issues can occur near the surface of your skin. These clotting issues can cause large skin blemishes. The condition of a person's skin usually

reflects the health of his or her liver. Our livers have a big impact on our appearance. This is because our livers are considered the metabolic factories of our body. The liver creates energy which helps our bodies function. If a person's liver is not breaking down toxins the way it should be, your body tries to eliminate these toxins in other ways and many times it does through the skin.

.....

If you have an oversized stomach with swollen ankles and skinny or weak arms and legs, it could be a direct result from fluid imbalances that are commonly caused by a diseased liver. This can also occur around your temples and above your cheeks. These symptoms are late stage liver disease symptoms so it's highly unlikely you're experiencing these symptoms out of the blue.

**4. Watch the video from the start to 05:00. Answer the questions.**

<https://youtu.be/i7G30doBHE0>

a) What is bilirubin and what is it responsible for?

---

b) Damaged liver causes our skins and eyes yellow. Why?

---

c) What are other symptoms of jaundice apart from yellow skins or eyes?

---

d) How is liver damage related to confusion?

---

e) What are the symptoms of muscle wasting?

---

f) What causes muscle wasting?

---

g) Why do you feel pain in the upper right part of your abdomen?

---

h) What are other symptoms related to liver damage and swollen abdomen?

---

i) What is hepatitis?

---

j) What causes skin blemishes?

---

k) Why does the skin reflect the health of the liver?

---



**5. Watch the video from 05:00 to the end. Answer the questions.**

<https://youtu.be/i7G30doBHE0>

We damage our liver because of our lifestyle choices. How can we prevent liver damage?

- a) \_\_\_\_\_
- b) \_\_\_\_\_
- c) \_\_\_\_\_
- d) \_\_\_\_\_
- e) \_\_\_\_\_
- f) \_\_\_\_\_
- g) \_\_\_\_\_
- h) \_\_\_\_\_
- i) \_\_\_\_\_

**6. Watch the video again from 05:00 to the end. Answer the questions.**

<https://youtu.be/i7G30doBHE0>

- a) How can vitamin E help minimize the symptoms of liver disease?
- b) What are good sources of vitamin E?
- c) Why is it important to drink a lot of water?
- d) Why is smoking a major risk factor for liver disease and liver damage?
- e) Why should we cut down on carb intake?

**7. Use these extracts below to complete the text about a gall bladder.**

**GALL BLADDER**

*send bile directly*

*contracts and sends*

*break fat into*

*until it is needed*

*located under the liver*

*digested and absorbed*

*to the gall bladder*

*takes extra water out of*

*a small tube*

The liver doesn't actually ..... to the small intestine. Instead, after the liver makes bile, the bile is sent ..... . The gall bladder is a small organ ..... . The gall bladder concentrates (.....) the bile and stores it ..... . When food is present in the small intestine, the gall bladder ..... bile along a duct (.....) to the small intestine. In the small intestine, the bile helps to ..... smaller droplets to be ..... more easily.

**8. Match the sentence halves to make a paragraph about gallstones.**

## GALLSTONES

- a) Gallstones are like .....
- b) They often form when .....
- c) Cholesterol is a fat-like .....
- d) Bile .....
- e) Gallstones can be very painful because .....
- f) The gallstones can also block .....
- g) A doctor may choose to break .....
- h) If that happens, the person must be careful not to eat too much fat at one time because .....

..... a person has too much cholesterol in their diet.

..... or prevent bile from going to the small intestine, preventing proper fat digestion.

..... there won't be as much bile going into the small intestine to help with fat digestion.

..... contains cholesterol.

..... the crystals have sharp edges and irritate the wall of the bile duct.

..... big salt crystals that may lodge (get stuck) in the bile duct or accumulate in the gall bladder.

..... molecule that is found in foods such as meat, butter and eggs.

..... gallstones apart using ultrasound or, in more serious cases, a person's gallbladder may be removed.

### EXTRA VIDEOS!

**Watch these videos in your free time and enjoy!**

What does the liver do? <https://ed.ted.com/lessons/what-does-the-liver-do-emma-bryce>

What is bile? <https://youtu.be/XvqsUZxtwE8>

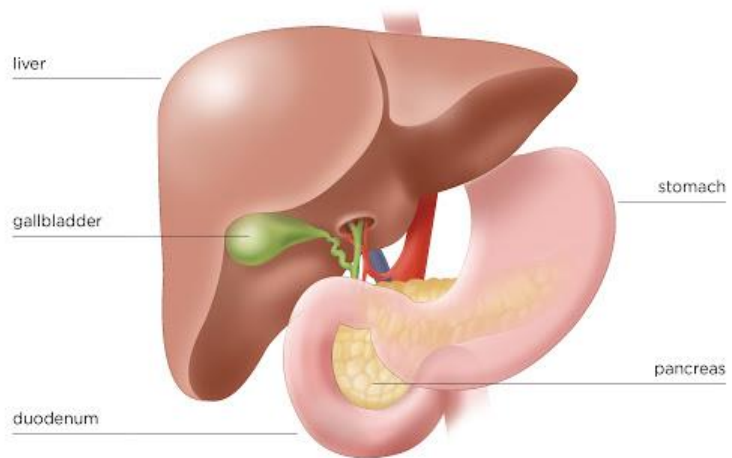
## PANCREAS

In this chapter you will learn the language related to:

- a pancreas: its parts, functions, digestion,
- the regulation of blood sugar,
- diabetes mellitus.

### 1. Read the text and complete the table below.

Another accessory organ that sends important molecules to the small intestine to aid in digestion is the *pancreas* /'pæŋkriəs/. The pancreas is located near the first portion of the small intestine and just beneath the stomach. The pancreas produces digestive enzymes that are used in the small intestine to break down sugars, proteins, and fats. These enzymes travel from the pancreas to the small intestine in a watery liquid that contains *sodium bicarbonate* /,səʊdiəm baɪ'kɑ:bənət/. Sodium bicarbonate is important because it neutralizes acid in the food entering from the stomach. Sodium bicarbonate protects the small intestine from stomach acid, just like mucus protects the stomach. The neutralization of acid by sodium bicarbonate also creates an optimal environment for digestion in the small intestine. Digestion there works best when conditions are not acidic.



Molecule	Where is it made?	Where does it go?	Function
Sodium bicarbonate			
Digestive enzymes			
Bile			

**2. Read the text and translate the words in brackets into English. Then make at least two questions to each paragraph.**

**Par. 1.** The pancreas is an important organ in the digestive system. It is located in the upper abdomen directly behind the stomach and next to the small intestine. In most adults it is between six and ten inches long and two inches wide. The pancreas is comprised primarily of a network of tubes or ..... (przewody trzustkowe) that release liquids into the upper portion of the small intestine called the ..... (dwunastnica). Anatomically, the pancreas is divided into three regions: ..... (głowa), ..... (trzon) and ..... (ogon).

**Par. 2.** The pancreas has two functions: ..... (zewnątrzwydzielnicza) and ..... (wewnątrzwydzielnicza). Its ..... (funkcja zewnątrzwydzielnicza) is to produce the chemicals or hormones that regulate blood sugar such as *insulin*. It's ..... (funkcja wewnątrzwydzielnicza) is to produce enzymes that help to digest food. ..... (amylaza trzustkowa) breaks down carbohydrates or starches into glucose. ..... (proteazy) break down protein into amino acids. And ..... (lipazy) break down fats.

**Par. 3.** Because these digestive enzymes are so powerful they are wrapped in a protective layer while they are in the pancreas. To reach the gastrointestinal tract the digestive enzymes travel through the pancreatic ducts and are eventually released into the duodenum at the major papilla also known as *the* ..... (bańka Vater). Once they are completely out of the pancreas, the protective layer is removed and the enzymes become active. ..... (żółć) from the ..... (woreczek żółciowy) also enters the duodenum at the major papilla. Bile breaks apart fat into smaller fat droplets which are easier for lipase to digest. When the pancreas is healthy it contributes to a healthy digestive system.

**Par. 4.** However, when our pancreas does not function correctly and is unwell we can have trouble digesting food properly or maintaining our blood sugar in a healthy range. The consequences of an unwell pancreas may include ..... (biegunka), bloating, ..... (wzdęcia), oily and foul-smelling stool, ..... (utrata wagi), ..... (niedożywienie), poor blood sugar control and diabetes. Heavy alcohol consumption, high-fat diets, eating large meals, being overweight and tobacco products can put stress on your pancreas causing it to work less well. There are also some genetic conditions that affect the pancreas, notably ..... (zwłóknienie torbielowate).

**Par. 5.** To help keep your pancreas healthy eat a very diet that is rich in fruits and vegetables. Include fish and white meats as favourite sources of protein. Limit high-fat foods and alcohol to special occasions. Maintain a healthy weight and watch your cholesterol and ..... (poziom trójglicerydów).

- Q1. ....
- Q2. ....
- Q3. ....
- Q4. ....
- Q5. ....
- Q6. ....
- Q7. ....
- Q8. ....
- Q9. ....
- Q10. ....

**3. Complete the gaps with missing words. Watch the video and check.**

*<https://ed.ted.com/lessons/what-does-the-pancreas-do-emma-bryce>*

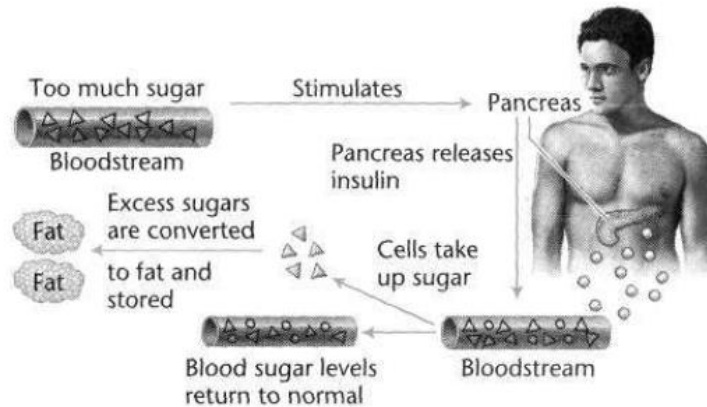
- a) The pancreas controls your ..... levels and produces a special juice that releases the nutrients from your food to help keep you in the best possible shape.
- b) The pancreas sits just behind your ..... . It aids ..... by producing a special tonic made of water, sodium bicarbonate, and digestive ..... . Sodium bicarbonate ..... the stomach's natural acidity, so these digestive enzymes can perform their jobs. Lipase breaks down ..... substances, protease splits up ....., and amylase divides ..... to create energy-rich sugars. Most of those nutrients then get absorbed into the blood stream, and go on to enrich the body.
- c) The pancreas controls the amount of sugar in your blood. It achieves this with the hormones: ..... and ....., which are produced in special cells called .....
- d) After a big meal, the blood often becomes flushed with sugar. To bring us back to normal, the pancreas releases ....., which makes the excess sugar move into cells, where it's either used as an energy source, or ..... for later. Insulin also tells the liver to shut down sugar production.
- e) If blood sugar is low, the pancreas releases a hormone called ..... that tells the body's cells and liver to release stored sugars back into the bloodstream. The interplay between insulin and glucagon is what keeps our sugar levels balanced.
- f) If the pancreas weakened by disease, the organ's ability to produce insulin may be reduced, or even extinguished, which can trigger the condition known as .....

**4. Read the text about the regulation of blood sugar. With the help of the diagrams, tell your friend what happens when blood sugar levels are high and low.**

## REGULATION OF BLOOD SUGAR

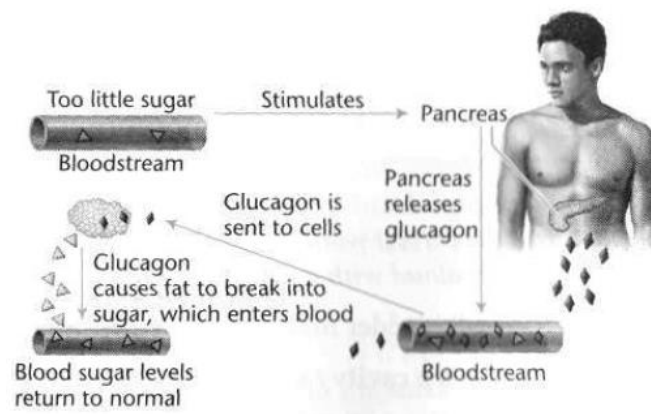
In addition to making enzymes and sodium bicarbonate, the pancreas is also important as *an endocrine gland* /'endəkrɪn ˌglænd/. Endocrine glands make hormones that are important in maintaining *blood sugar homeostasis* /ˌhəʊmiəʊ'steɪsɪs/.

**Insulin** is a hormone produced by the pancreas. After you've eaten a meal, blood sugar (*glucose*) levels begin to rise, causing the pancreas to secrete insulin. Insulin causes the cells to take the sugar out of the blood and use it for energy. If the cells do not need all the sugar, the cells convert the sugar to fat.



When blood sugar levels are high, the pancreas releases insulin. Insulin causes cells of the body to take up sugar and store it as fat. The blood sugar levels then return to normal.

**Glucagon** is another hormone produced by the pancreas. Your blood sugar levels decrease if you go several hours without eating a meal. This is because insulin has told cells to take sugar out of the blood. However, organs like the brain still need to get sugar from the blood to function properly. The low level of glucose in your blood causes the pancreas to stop secreting insulin and to secrete glucagon instead. Glucagon causes more sugar to enter the blood from the cells that have stored it as fat.



When blood sugar levels are low, the pancreas releases glucagon. Glucagon causes cells to convert fat into sugar, which enter the blood. The blood sugar levels then return to normal.

5. Decide which type of diabetes these sentences refer to.

**DIABETES MELLITUS** /daɪəˌbi:tɪz ˈmɛlɪtəs/

When blood sugar homeostasis is not properly maintained a person may have diabetes mellitus. There are two categories: *Type I (Insulin-Dependent) Diabetes* and *Type II (Non-Insulin Dependent) Diabetes*.

It most often begins at adolescence (ages 11-13) and is sometimes called *juvenile diabetes*.

It most often begins in late adulthood (50-70 years).

People who are overweight and have a family history of this disorder are more likely to get it.

In this type of diabetes, the pancreas is not able to make insulin. Therefore, the body often has too much glucose in the blood.

In this case, insulin may be produced in adequate amounts, but the body's cells do not respond to the insulin correctly.

People with this type of diabetes must monitor their glucose levels during the day and inject insulin as needed to maintain adequate blood sugar levels.

The individuals with this type of diabetes may be able to control their diabetes with medication and proper diet and exercise.

**TYPE I    TYPE II**


**EXTRA VIDEO!**

**Watch this video in your free time and enjoy!**

*What did dogs teach humans about diabetes?*

<https://ed.ted.com/lessons/what-did-dogs-teach-humans-about-diabetes-duncan-c-ferguson>

## SMALL INTESTINE

---

In this chapter you will learn the language related to:

- a small intestine,
- the structure of villi,
- absorption,
- the causes, signs, symptoms and treatment of diarrhoea,
- how thyroid manages metabolism.

### 1. Work in pairs. Discuss the questions.

When you eat food, it is held in your small intestine for up to four hours. Why does it take so long?

Can you live without a small intestine?

What is the connection between the thyroid and the small intestine?

### 2. Choose the correct answer to complete each sentence. You will check your answers at the end of this class.

The small intestine is the location where .....

- a) most foods are digested
- b) most foods are absorbed
- c) most foods are digested and absorbed
- d) very little food is digested and absorbed

After food is digested, it .....

- a) enters the blood immediately
- b) enters intestinal cells and then passes into capillaries
- c) passes immediately into the large intestine
- d) is eliminated.

Blood containing food molecules goes from the small intestine to the .....

- a) pancreas
- b) stomach
- c) liver
- d) large intestine

The liver .....

- a) makes bile
- b) stores excess sugar
- c) takes toxins out of food
- d) all of the above

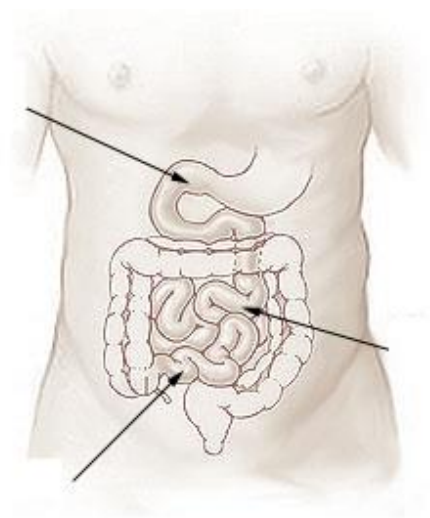


**3. Read the text and label the diagram with the parts of the small intestine.**

When liquefied food leaves the stomach and enters the small intestine, bile and pancreatic juices follow. Enzymes in the wall of the small intestine and pancreatic enzymes digest food, breaking it into smaller molecules. The majority of food digestion occurs in the small intestine. The only exceptions are the partial digestion of starch in the mouth by saliva and the partial digestion of proteins in the stomach.

The small intestine is the longest part of the digestive tract. It is approximately six metres long in the average person so it is about three times the length of your body. The small intestine assists in the digestion and absorption of ingested food. Anatomically, it is divided into three parts: *the duodenum, jejunum, and ileum.*

The *duodenum* is the first section of the small intestine and is the shortest part of the small intestine. It is where most chemical digestion using enzymes takes place. The *jejunum* is the middle section of the small intestine. It has a lining designed to absorb carbohydrates and proteins. The *ileum* is the final section of the small intestine. The function of the ileum is mainly to absorb vitamin B12, bile salts and any products of digestion that were not absorbed by the jejunum.

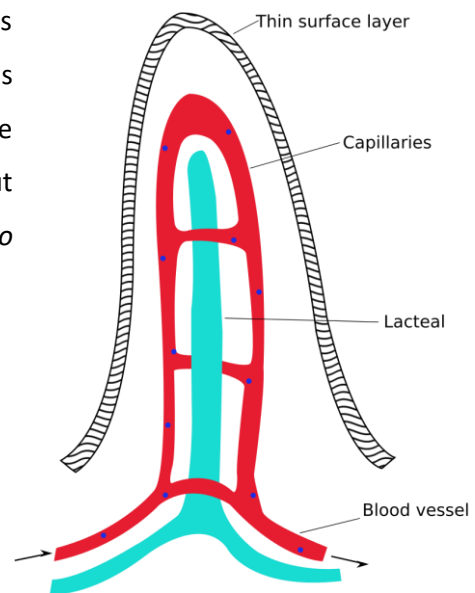


**VILLI**

The inner wall of the small intestine is highly folded and has many small projections called *villi*. The structure of the villi is especially adapted for food absorption as it increases the surface area of tissue available to absorb nutrients from the gut contents. **Watch the video** ([https://youtu.be/SDbjwMS\\_1vI](https://youtu.be/SDbjwMS_1vI)) to see villous mucosa of the terminal ileum.

**4. Read and complete the text with words from the diagram.**

Each villus has a lymph vessel called ..... in the centre, which is surrounded by a network of .....



**5. Watch the video from 00:05 to 01:05. [https://youtu.be/Onoq1Ok7\\_KM](https://youtu.be/Onoq1Ok7_KM)**

What increases the surface area of the small intestine for absorption?

- a) .....
- b) .....
- c) .....
- d) .....

**ABSORPTION**

**6. Complete the text about absorption with the missing parts.**

- a) which are small blood vessels
- b) while others remain in the blood
- c) For example, if there is a lot of sugar
- d) that line the small intestine
- e) that eventually lead to the liver
- f) Because the membrane of the intestinal cells
- g) In addition to making bile

Most of the smaller food molecules pass through cells ..... and enter the bloodstream. This process is called absorption. .... only allows smaller food molecules to pass in and out of the cell, food must be digested first before it can be absorbed.

Once the food molecules pass through the cells that line the small intestine, they enter capillaries, ..... that lie just beneath the intestinal cells. These capillaries transport the molecules to larger vessels ..... . In the liver, some of the food molecules are stored for later use, ..... for immediate use by the body's cells. .... in the blood after eating, insulin tells the liver to store it. .... and storing food molecules, the liver also takes poisons (for example, alcohol or drugs) out of the food.

**7. Read the text and complete it with the sentences. Watch the video and check.**

<https://youtu.be/6nonjzzCSUU>

- a) Each villus has a lymph vessel called lacteal in the centre.
- b) The lipids and lipid soluble vitamins in the lacteal are transported to the main lymph vessels and eventually to the bloodstream.
- c) This absorption process mainly takes place in the ileum.
- d) The lipid droplets then enter the lymph in the lacteal.
- e) Water-soluble food molecules such as monosaccharides, amino acids and minerals as well as water-soluble vitamins such as vitamin C are absorbed through the walls of the villi into the capillaries by diffusion and active transport.
- f) On the other hand, fatty acids and glycerol enter the epithelium of the villus by diffusion.

After food is digested into small and soluble food molecules it can be absorbed into the circulatory system.

.....

On the inner wall of the ileum there are a large number of finger-like projections called villi.

.....

The lacteal is surrounded by a network of capillaries.

.....

As the absorption of digested food into the blood increases the water potential of the content in the ileum, water is drawn into the blood by osmosis.

.....

In the epithelial cells they recombine into fine lipid droplets.

.....

Lipid soluble vitamins such as vitamins A and D are also absorbed into the lacteal.

.....

When digestion and absorption is complete in the small intestine, peristalsis occurs to push the food waste forward into the large intestine.

.....

### DIARRHOEA

If something causes food to move to quickly through the small intestine, very little of the water is absorbed. This cause faeces (waste) to become liquid, a condition called *diarrhoea*.

**8. Watch the video and answer the questions.** [https://youtu.be/EGtihfAhd\\_c](https://youtu.be/EGtihfAhd_c)

What are the causes of diarrhoea?

- a) .....
- b) .....
- c) .....
- d) .....
- e) .....
- f) .....
- g) .....

What are the signs and symptoms of diarrhoea?

- a) .....
- b) .....
- c) .....
- d) .....

- e) .....
- f) .....
- g) .....
- h) .....

The excessive loss of water in your stool can also sometimes lead to *dehydration* which can be serious if it's not recognized and treated quickly. The signs of dehydration in adults can include:

- a) .....
- b) .....
- c) .....
- d) .....
- e) .....
- f) .....
- g) .....
- h) .....
- i) .....

How can we diagnose diarrhoea?

- a) .....
- b) .....
- c) .....
- d) .....
- e) .....

How can we treat diarrhoea?

- a) .....
- b) .....
- c) .....
- d) .....
- e) .....
- f) .....
- g) .....
- h) .....
- i) .....

## REGULATION OF CELLULAR METABOLISM

When cells use energy in food molecules, this is called *metabolism*. The cell either converts the food molecule to a stored form of energy (such as fat) or uses the energy to do its work (such as muscle contraction).

*Thyroid hormone*, made by the thyroid gland in the neck, helps to regulate cellular metabolism. The amount of thyroid hormone in the body is monitored by the *pituitary gland*. If there is too little thyroid hormone, the pituitary gland releases *Thyroid Stimulation Hormone* (or TSH). TSH cause the thyroid gland to release more thyroid hormone. When there is enough thyroid hormone in the blood, the pituitary gland stops releasing TSH. This is a form of negative feedback, that is a method to maintain homeostasis by returning a condition to normal.

### 9. Decide if these statements refer to hypothyroidism (write HYPO) or hyperthyroidism (write HYPER).

..... A person's metabolic rate is high, which leads to increases in blood pressure, restlessness, weight loss, and irregular heart rate.

..... It is a condition in which the person makes too little thyroid hormone.

..... A person's metabolic rate is below normal.

..... This condition may be caused by tumours in the pituitary or thyroid gland, or by the body mistakenly stimulating the thyroid to produce its hormone.

..... In infants, it leads to cretinism, which means that the child has poor skeletal and nervous system development (mental retardation).

..... People with this condition are often weak, tired, and feel cold.

..... It is a condition in which the person makes too much thyroid hormone.

..... People with this condition may also experience weight gain malfunction (not working properly).

An enlargement of the thyroid gland that is not caused by cancer is called a *goitre*. Sometimes, the thyroid becomes so large that the goitre is visible as a large lump at the front of the neck. Goitre can be caused by too much TSH or by deficient (too little) iodine. Iodine is required for thyroid hormone to be produced. Iodine deficiencies occur most often when people live in areas that have too little iodine in the soil or are not near the ocean.

### 10. Write TRUE or FALSE.

..... 1. Thyroid hormone increases cellular metabolism.

..... 2. TSH causes less thyroid hormone to be secreted.

..... 3. Someone with hypothyroidism has too much thyroid hormone.

..... 4. Someone with hypothyroidism would tend to lose weight.

..... 5. An infant who has hypothyroidism would have a condition called cretinism.

..... 6. A goitre can be caused by too little iodine in the diet.

**11. And now go to exercise 2 again and check your answers.**

**EXTRA VIDEO! Watch this video in your free time and enjoy!**

*How does your thyroid manage your metabolism?*

*<https://ed.ted.com/lessons/how-does-the-thyroid-manage-your-metabolism-emma-bryce>*

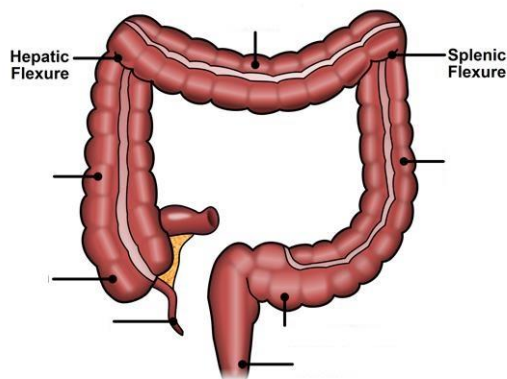
## LARGE INTESTINE

In this chapter you will learn the language related to:

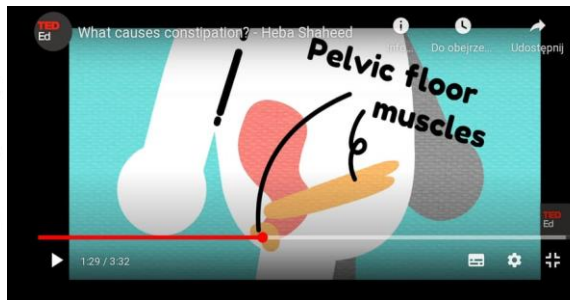
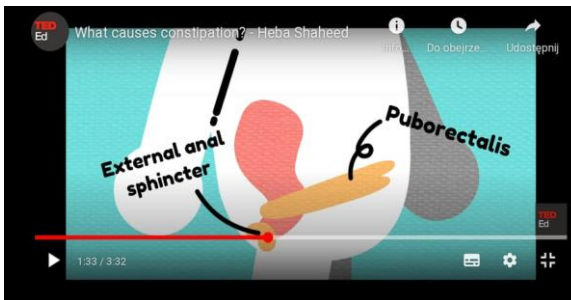
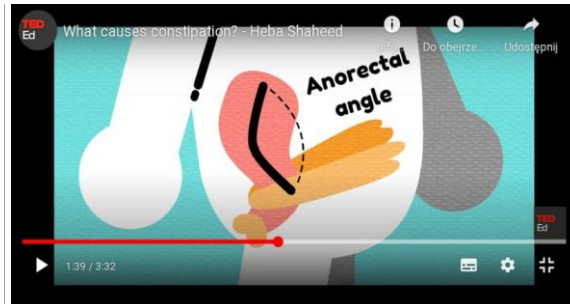
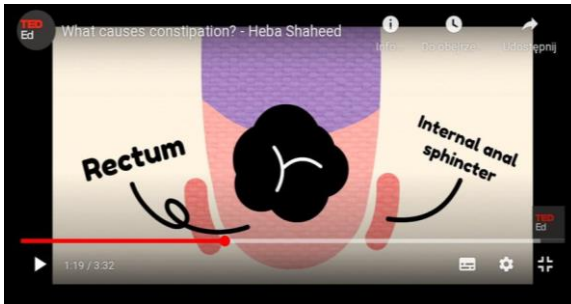
- a large intestine: its parts and functions,
- constipation,
- the Bristol stool chart.

### 1. Label the picture with the missing parts.

ascending colon, transverse colon, descending colon, sigmoid colon, rectum, appendix, caecum, anus



### 2. Look at the pictures from the video. Translate the terms into Polish.



**3. Choose the right answer. Then watch the video on what causes constipation and check your answers.** <https://ed.ted.com/lessons/what-causes-constipation-heba-shaheed#review>

The large intestine is split into \_\_\_ sections.

- a) 2
- b) 4
- c) 6
- d) 8

What does stool consist of?

- a) ingested food
- b) bile
- c) digestive juices
- d) all of the above

Which pelvic floor muscles regulate your body's decision to physically retain or expel stool?

- a) the large intestine and small intestine
- b) the puborectalis and anorectal angle
- c) the puborectalis and external anal sphincter
- d) none of the above

The factors behind constipation are \_\_\_\_\_ and \_\_\_\_\_.

- a) a stool's slow movement through the colon
- b) a loosening of the small intestine
- c) a pelvic dysfunction
- d) both a and c

What is the correct technique for squatting?

- a) elevate your feet on a stool and lean backward with a straight back
- b) elevate your feet on a stool and lean forward with a straight back
- c) keep your feet on the ground and lean forward with a straight back
- d) keep your feet on the ground and lean backward with a straight back

**4. Watch the video again and answer the questions.**

In what way is the Bristol stool chart helpful as a medical diagnostic tool?

.....

Describe how pelvic floor dysfunction influences the body's expulsion of waste. What factors contribute to pelvic floor dysfunction?

.....

If you're experiencing chronic constipation, what are some dietary and/or lifestyle changes you can follow to alleviate the issue?

.....



## BRISTOL STOOL CHART

5. Look at the Bristol Stool Chart. Complete the information below on the chart (in the space provided under each type of stool).

watery, no solid pieces, entirely liquid

separate hard lumps, like nuts (hard to pass)

sausage shaped but lumpy

like a sausage or snake, smooth and soft

like a sausage but with cracks on its surface

soft blobs with clear cut edges (passed easily)

fluffy pieces with rugged edges, a mushy stool

## BRISTOL STOOL CHART



TYPE 1 - SEVERE CONSTIPATION



TYPE 2 - MILD CONSTIPATION



TYPE 3 - NORMAL



TYPE 4 - NORMAL



TYPE 5 - LACKING FIBER



TYPE 6 - MILD DIARRHEA



TYPE 7 - SEVERE DIARRHEA

## BIBLIOGRAPHY

---

### Adapted from:

*Anatomy and Physiology for English Language Learners*, Judy Meier Penn, Elizabeth Hanson, wyd. Pearson Longman, 2006.

*Macmillan Vocabulary Practice Series, Science*, Keith Kelly, wyd. Macmillan, 2008.

### CHAPTER 1

<https://youtu.be/Q72559sVDa4>

<https://youtu.be/-1aZj6v6dxc>

<https://pl.depositphotos.com/vector-images/digestion.html?qview=31047269>

[https://commons.wikimedia.org/wiki/File:Digestive\\_system\\_diagram\\_no\\_labels\\_arrows.svg](https://commons.wikimedia.org/wiki/File:Digestive_system_diagram_no_labels_arrows.svg)

### CHAPTER 2

<https://youtu.be/i5OOVXI0yAI>

<https://youtu.be/ZE-TtFhZIDw>

<https://youtu.be/wVF-iVgEzYY>

<https://ed.ted.com/lessons/what-causes-cavities-mel-rosenberg>

<https://ed.ted.com/lessons/what-causes-bad-breath-mel-rosenberg>

<https://ed.ted.com/lessons/how-did-teeth-evolve-peter-s-ungar>

[https://commons.wikimedia.org/wiki/File:Salivary\\_glands\\_numbered.svg](https://commons.wikimedia.org/wiki/File:Salivary_glands_numbered.svg)

<https://irenamacri.com/wp-content/uploads/2019/05/five-tastes-food-tongue.jpg>

<https://ciroccodentalcenterpa.com/wp-content/uploads/teeth.jpg>

[https://study.com/cimages/multimages/16/13579176854\\_46925beab1\\_m.jpg](https://study.com/cimages/multimages/16/13579176854_46925beab1_m.jpg)

[https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcSPhhdf6\\_z-0U8iRjMjYH7XYV4-8YH6WRgzQ&usqp=CAU](https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcSPhhdf6_z-0U8iRjMjYH7XYV4-8YH6WRgzQ&usqp=CAU)

### CHAPTER 3

<https://youtu.be/FuWOXkYr274>

<https://youtu.be/HCCSIdyOSCM>

<https://youtu.be/RYsz2Od5jDQ>

<https://youtu.be/tEliEAn7b-U>

<https://youtu.be/rJS-Kh5wCQU>

<https://ed.ted.com/lessons/what-causes-heartburn-rusha-modi>

[http://biomodderfied.weebly.com/uploads/5/4/3/7/54376571/published/peristalsis\\_4.png?1486407789](http://biomodderfied.weebly.com/uploads/5/4/3/7/54376571/published/peristalsis_4.png?1486407789)

<https://www.gutcare.com.sg/wp-content/uploads/2018/09/GERD-treatment-cost-singapore.jpg>

### CHAPTER 4

<https://youtu.be/ZuJzYYIS9c4>

<https://youtu.be/hvfye6nokpQ>

## BIBLIOGRAPHY

<https://youtu.be/SWMWsOXIBwE>

<https://youtu.be/E0IBMWQDEH4>

<https://ed.ted.com/lessons/the-surprising-cause-of-stomach-ulcers-rusha-modi>

[https://www.cancer.gov/PublishedContent/Images/images/illustrations-graphics/stomach-regions-illustration-article.\\_\\_v40015971.jpg](https://www.cancer.gov/PublishedContent/Images/images/illustrations-graphics/stomach-regions-illustration-article.__v40015971.jpg)

### CHAPTER 5

<https://youtu.be/vw5qjJgGVKo>

<https://youtu.be/i7G30doBHE0>

<https://ed.ted.com/lessons/what-does-the-liver-do-emma-bryce>

<https://youtu.be/XvqsUZxtwE8>

<https://thumbs.dreamstime.com/b/human-liver-gallbladder-pancreas-anatomy-vector-duodenum-isolated-illustration-49750398.jpg>

### CHAPTER 6

<https://www.youtube.com/watch?v=NZ4zcrTzUjA>

<https://ed.ted.com/lessons/what-does-the-pancreas-do-emma-bryce>

<https://ed.ted.com/lessons/what-did-dogs-teach-humans-about-diabetes-duncan-c-ferguson>

[https://pancreatic.org/wp-content/uploads/2015/06/Pancreas\\_Nearby\\_Organs-01.jpg](https://pancreatic.org/wp-content/uploads/2015/06/Pancreas_Nearby_Organs-01.jpg)

### CHAPTER 7

[https://youtu.be/Onoq1Ok7\\_KM](https://youtu.be/Onoq1Ok7_KM)

[https://youtu.be/SDbjwMS\\_1vl](https://youtu.be/SDbjwMS_1vl)

<https://youtu.be/6nonjzzCSUU>

[https://youtu.be/EGtihfAhd\\_c](https://youtu.be/EGtihfAhd_c)

<https://ed.ted.com/lessons/how-does-the-thyroid-manage-your-metabolism-emma-bryce>

<https://courses.lumenlearning.com/boundless-ap/chapter/the-small-intestine/>

[https://upload.wikimedia.org/wikipedia/commons/3/3d/llu\\_small\\_intestine.jpg](https://upload.wikimedia.org/wikipedia/commons/3/3d/llu_small_intestine.jpg)

[https://kids.kiddle.co/images/thumb/3/3d/Intestinal\\_villus\\_simplified.svg/300px-Intestinal\\_villus\\_simplified.svg.png](https://kids.kiddle.co/images/thumb/3/3d/Intestinal_villus_simplified.svg/300px-Intestinal_villus_simplified.svg.png)

### CHAPTER 8

<https://ed.ted.com/lessons/what-causes-constipation-heba-shaheed#review>

<https://www.researchgate.net/profile/Roland-Bruderer-2/publication/330863722/figure/fig2/AS:725464104591360@1549975529103/Overview-of-Colon-and-Resection-Sites-of-the-105-Tissue-Samples-Samples-cancer-healthy.png>

<https://www.researchgate.net/profile/Roland-Bruderer-2/publication/330863722/figure/fig2/AS:725464104591360@1549975529103/Overview-of-Colon-and-Resection-Sites-of-the-105-Tissue-Samples-Samples-cancer-healthy.png>

[https://kobietamag.pl/wp-content/uploads/2016/04/bristol\\_stool\\_chart.gif](https://kobietamag.pl/wp-content/uploads/2016/04/bristol_stool_chart.gif)