

Lesson 7: Respiratory and Skeletal Systems and Tuberculosis

Glossary

1. **asthma:** when the tubes that carry air in your lungs swell, making it hard to breathe
2. **bacteria:** tiny living creatures that can only be seen with a microscope; some bacteria help the human body, and other bacteria make the body sick
3. **bones:** protect organs and store minerals that the body needs to work
4. **cartilage:** a “soft” kind of bone (found in ears and nose, for example)
5. **Chronic Obstructive Pulmonary Disease (COPD):** respiratory disease where lung damage causes people to breathe in less air
6. **cilia:** tiny hairs in the nose, parts of the throat, trachea, and lungs that stop dirt from getting in the lungs
7. **dislocation:** when a bone moves out of its normal position in a joint
8. **joint:** spaces between the bones that allow movement to happen
9. **ligaments:** a type of tissue that connects bone to bone
10. **lungs:** organs located in the chest that take in air and give oxygen to the rest of the body
11. **osteoporosis:** a condition that causes a person’s bones to become more weak
12. **oxygen:** part of the air we breathe that the body needs to make energy
13. **respiratory disease:** disease that impacts the respiratory system
14. **respiratory system:** the group of organs and body parts that are responsible for making the body breathe
15. **tendons:** a type of tissue that connects bone to muscle
16. **tissues:** a group of cells working together to do a specific job in the body (for example, muscles are a type of tissue)
17. **Tuberculosis:** a disease, also known as TB, caused by bacteria that usually affects the lungs
 - a. **Tuberculosis (Active):** a disease where TB bacteria are present in the body, the person has symptoms of TB, and they may be able to spread TB to others
 - b. **Tuberculosis (Latent):** an infection when TB bacteria are present in the body, but the person isn’t sick and can’t spread it to others

Lesson 7: Respiratory and Skeletal Systems and Tuberculosis

Reading Comprehension

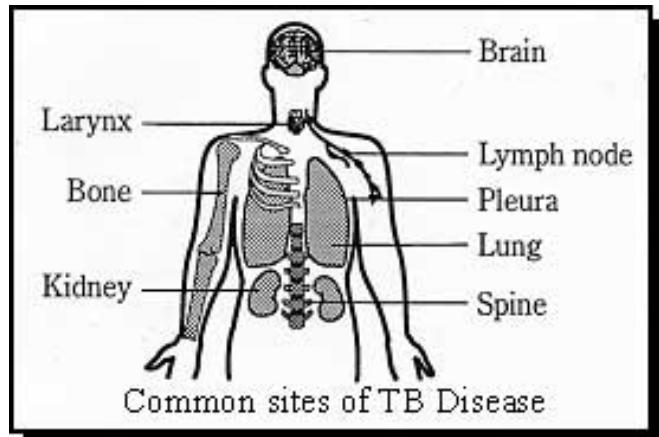
Tuberculosis

Tuberculosis, also called TB, is an illness that can be prevented, treated, and cured.

What is TB? Tuberculosis is a disease caused by a type of **bacteria**. TB often affects the lungs, but it can also affect all other parts of the body. There are two types of TB:

Latent (TB infection): A person with latent TB has TB bacteria in their body, but the bacteria are latent (the germs are “sleeping”). The person does not have symptoms but can become sick in the future with active TB. Someone with latent TB cannot spread the bacteria to others. People with latent TB can take special TB medicine to kill the TB germs so they don’t become sick in the future.

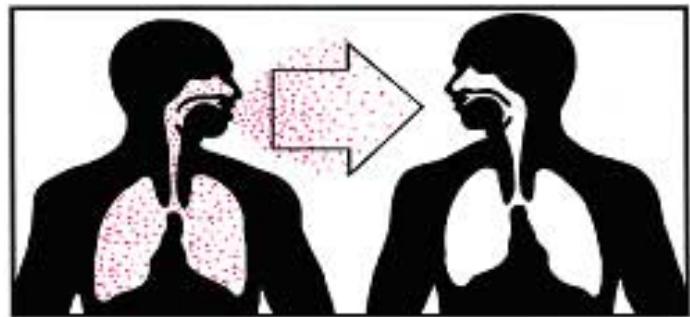
Active (TB disease): A person who has active TB has symptoms of the disease, like coughing or losing weight, and usually feels sick. Active TB bacteria multiply and destroy **tissues** in the body. Someone with active TB can spread TB to others. People with active TB must take special TB medicines to be cured.



Centers for Disease Control and Prevention

How does someone get TB?

TB is spread through the air when somebody with active TB coughs, sneezes, talks, or sings. Other people near them can breathe the TB germs into their own lungs. Sharing food and clothes does NOT spread TB germs.



Centers for Disease Control and Prevention

What are some symptoms of TB?

- Cough that lasts for three weeks or longer
- Losing weight
- Sweating at night or during sleep
- Chest pain
- Coughing up blood or phlegm
- Weakness or tiredness
- Loss of appetite
- Chills and fever

Write short answers based on the reading.

1. What is latent TB?

2. What is active TB?

3. How does someone get TB?

4. Name 3 symptoms of TB.

Lesson 7: Respiratory and Skeletal Systems and Tuberculosis

Reading and True or False

Tuberculosis treatment and prevention

Why is it important to know about TB treatment and prevention?

People with active TB who do not take TB medicines may have permanent damage to their body and might die. They will also keep spreading the disease to other people.

How do I get tested for TB?

There are two common ways to be tested for TB:

1. TB blood test. A small amount of your blood is tested in a laboratory.
2. TB skin test. A small amount of fluid is injected into the skin on your arm. After 2-3 days, a nurse or doctor checks your arm to see if there is a reaction.

Understanding results (for both types of test):

Negative: A negative test means that you probably *do not* have TB bacteria in your body.

Positive: A positive result shows that you probably *do* have TB bacteria in your body. If a test result for TB is positive, the doctor may do other tests like x-rays or sputum (phlegm) samples.

Is there a treatment for TB?

People with latent or active TB can be treated. TB germs are very powerful, so it is very important to follow the doctor's instructions EXACTLY to kill all of the germs.

Who gets TB?¹

Anybody can get TB. Some people are more likely to get TB:

- People who were born in a part of the world where TB is common
- People with HIV/AIDS
- People who have been exposed to other TB patients. If you have been exposed to someone with TB, talk to your doctor.
- People who inject illegal drugs
- Babies and young children
- Elderly people
- Individuals who were not correctly treated for TB
- People with medical conditions, such as diabetes, cancer, and kidney problems

How do I learn more about tuberculosis?

- Talk to your doctor
- Web resources:
www.mayoclinic.com/health/tuberculosis/DS00372
www.cdc.gov/tb/education/patient_edmaterials.htm
www.health.state.mn.us/divs/idepc/diseases/tb/ed/index.html

Read each sentence. Then circle True or False.

1. TB can damage your body if you do not take medication. True False
2. A TB skin test is one way to check for tuberculosis. True False
3. A negative test means that you have TB in your body. True False
4. It is possible to treat active TB. True False
5. People with HIV/AIDS cannot get TB. True False
6. No treatment is available for latent TB. True False
7. Anybody can get TB. True False
8. People who do not take their medicine may be able to spread the disease to other people. True False

¹ <https://www.cdc.gov/tb/risk-factors/index.html>

Lesson 7: Respiratory and Skeletal Systems and Tuberculosis

Vocabulary Card Match and Writing

Chronic Obstructive Pulmonary Disease (COPD)	asthma	Respiratory disease where lung damage causes people to breathe in less air	When the tubes that carry air in your lungs swell, making it hard to breathe
tuberculosis	cilia	Disease caused by bacteria, often affecting the lungs – can be latent or active	Tiny hairs in the nose, trachea, and lungs that stop dirt from getting in the lungs
skeletal system	bones	Framework of the body; makes movement possible; protects organs	Protect organs and store minerals that the body needs to work
joints	tissues	Spaces between the bones enabling movement to happen	Fill the space at joints

Lesson 7: Respiratory and Skeletal Systems and Tuberculosis

Vocabulary Card Match and Writing

tendon	ligament	Connects bone to muscle	Connects bone to bone
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Read the following information about bone problems.

What are some examples of bone problems?

- **Osteoporosis** is a condition that causes a person's bones to become weak. People with osteoporosis are more likely to break their bones, especially in the hip, wrist, and spine.¹ This condition is common in the elderly, especially women.² Eating enough calcium and other nutrients helps to prevent osteoporosis. Exercise is also good for making bones strong.
- **Broken bones**: Sometimes a bone breaks. This can happen because of accidents, like falls. Broken bones can also occur if malnutrition makes the bones weak.
- **Dislocated bone**: Dislocation is when a bone moves out of its normal position in a joint.

Talk with a partner. What could be some ways to prevent osteoporosis?

¹ <https://www.cdc.gov/nutrition/features/healthy-eating-tips.html>

² <http://www.nlm.nih.gov/medlineplus/osteoporosis.html>

Lesson 7: Respiratory and Skeletal Systems and Tuberculosis

Sequencing and Writing

Why is the respiratory system important?

The main job of the **respiratory system** is to fill the body with oxygen and get rid of carbon dioxide. The body needs oxygen so that it can make energy. The respiratory system also helps your body get rid of carbon dioxide, a gas made by your cells.

Oxygen is found in the air we breathe. When we breathe, the oxygen enters our **lungs** and then moves into our blood. The blood moves oxygen to the rest of the body.

When we breathe in oxygen, we breathe out, or exhale, carbon dioxide. If carbon dioxide does not leave the body, severe health problems can occur.

After reading the passage above, read and think about the sentences below. Then number the sentences in order (1-7) to describe the cycle in which oxygen is delivered to the body.

- _____ Then the air travels down the throat and trachea.
- _____ Next, the air goes into the lungs.
- _____ Finally, the air is breathed out through the nose or mouth.
- _____ Then the oxygen is delivered to the body.
- _____ When air is exhaled, it goes out of the lungs.
- _____ 1 First, the nose or mouth breathes in air, which contains oxygen.
- _____ Then the air passes out of the trachea and throat.

How does the respiratory system work?

Oxygen gets traded for carbon dioxide. Oxygen travels through the blood and is shared throughout the body. Carbon dioxide travels through the respiratory system and is exhaled through the mouth and nose.

Cilia are tiny hairs in the nose, throat, trachea, and lungs. Cilia trap dirt. This helps to clean the air before air enters the lungs.

Now write the sentences from above in the correct order.

1. First, the nose or mouth breathes in air, which contains oxygen. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Lesson 7: Respiratory and Skeletal Systems and Tuberculosis

Conversation

Lee is going to the doctor to get a new inhaler for his asthma. Please read the conversation between Lee and his doctor. Practice with a partner.

Doctor: Lee, I know you have had problems breathing well because your asthma lately. I want you to try this new inhaler to see if it makes you feel better.

Lee: Thank you. I hope it helps.

Doctor: There are also other things you can do to improve the health of your lungs.

Lee: Like what?

Doctor: You should stop smoking. Smoking damages cilia, the little hairs in your lungs that remove dust and other things. Smoking also causes cancer and hurts other parts of the lungs, so the heart has to pump harder to deliver oxygen in the body. Over time, smoking can cause chronic obstructive pulmonary disease (COPD) and heart disease. Smokers are also more likely to get tuberculosis.

Lee: Hmm. I don't want to get those diseases. Maybe I'll try to stop smoking.

Doctor: That's a great first step. I can tell you about a program that will help you quit smoking. Lee, you should also avoid other air pollutants, like smoke from fires, car exhaust, paint, and cleaning supplies. If you have to be around these chemicals, wearing a mask and breathing through your nose will help filter the air and protect your lungs.

Lee: That's good to know. I'm the caretaker of an apartment building, so I am sometimes near chemicals. I'll make sure the area is well ventilated and use my face mask.

Doctor: That will help. I also encourage you to exercise more. Exercising improves your body's ability to take in air. Let's work together to manage your asthma so you're able to do whatever kind of exercise you like.

Lee: OK! I just joined my local fitness center.

Doctor: Well, Lee, it sounds like you are on your way to improving your lung function and overall health!

Lee: Thank you for your advice!

Talk with your partner and discuss the answers to the following questions.

1. What did the doctor recommend for Lee to improve his lung health?
2. Why is smoking dangerous for your health?
3. How can Lee help protect his lungs at his job?

Lesson 7: Respiratory and Skeletal Systems and Tuberculosis

Quiz

Read the questions. Then circle A, B, C or D.

1. What does the respiratory system do?
 - A. delivers blood to the body
 - B. gives oxygen to the body
 - C. digests food
 - D. none of these

2. Tuberculosis (TB) can spread by...
 - A. coughing
 - B. speaking
 - C. sneezing
 - D. all of these

3. What is the main cause of Chronic Obstructive Pulmonary Disease (COPD)?
 - A. exercise
 - B. smoking
 - C. drinking
 - D. diabetes

4. What is osteoporosis?
 - A. a condition that causes bones to become stronger
 - B. a condition that causes bones to become weaker
 - C. a digestive condition
 - D. a heart problem

5. What does NOT help improve lung function?
 - A. exercise
 - B. smoking
 - C. avoiding air pollutants
 - D. stopping smoking

6. What type of Tuberculosis (TB) causes symptoms?
 - A. latent
 - B. active
 - C. lazy
 - D. activity

7. Who is especially at risk for TB?
 - A. babies and young children
 - B. people with HIV/AIDS
 - C. people born in a part of the world where TB is common
 - D. all of the above

8. What does the skeletal system do?
 - A. provides a framework for other body structures to attach to
 - B. works with other body systems to make body movement possible
 - C. protects your organs
 - D. all of the above

Student Survey: Respiratory System Unit

1. Did you learn more information about TB and respiratory health from studying this lesson?

1	2	3	4	5
no		some		yes

2. Would you share this information with family and friends?

1	2	3	4	5
no		maybe		yes

3. After studying this lesson, are you more likely to ask your health care provider about respiratory health?

1	2	3	4	5
no		somewhat		yes

4. Do you know where to find more information about TB and respiratory health if you have more questions?

1	2	3	4	5
no		somewhat		yes

5. Did you like the class activities?

1	2	3	4	5
no		somewhat		yes

We value your opinions! Could you tell us what you liked or give us some suggestions on how to improve this lesson?

Thank you!