

Lesson 5: Cardiovascular and Nervous Systems / Hypertension

Glossary

Cardiovascular System Glossary

1. **Blood:** fluid that carries oxygen, nutrients, waste, and water to and from the cells in your body
2. **Blood pressure:** the force inside your blood vessels that pushes blood through your body
3. **Blood vessels:** tubes that carry blood through your body
4. **Heart:** a very strong muscle that pumps blood throughout the body
5. **Heart attack:** the heart does not get enough oxygen because a blood vessel leading to the heart is clogged
6. **Heart disease:** long-term problems with the heart and/or the blood vessels leading to the heart
7. **Hypertension:** when there is too much force in the blood vessels; also called high blood pressure
8. **Platelets:** help to plug up the hole when a blood vessel breaks
9. **Red blood cells:** carry oxygen back to cells
10. **Stroke:** lack of blood flow and oxygen to the brain
11. **Symptom:** a sign that you are sick, such as pain or fever
12. **White blood cells:** help the body defend against infections

Nervous System Glossary

1. **Brain:** part of the body that controls all functions of the body
2. **Involuntary action:** an action that happens unconsciously, such as digesting food
3. **Nerves:** collections of neurons that create a pathway for signals to travel between your brain and other parts of your body
4. **Neurons:** specialized nerve cells that receive and send signals throughout the body
5. **Voluntary action:** an action you control, such as kicking a ball

Lesson 5: Cardiovascular and Nervous Systems / Hypertension

Reading Comprehension

Cardiovascular System

The cardiovascular system's purpose is to circulate blood throughout the entire body. It is made up of the **heart** and **blood vessels**. The heart is a very strong muscle that pumps blood throughout the body. Blood vessels are the tubes that carry blood throughout the body.

Blood carries oxygen, nutrients, waste and water to and from body cells. There are three types of blood cells: red blood cells, white blood cells and platelets. **Red blood cells** carry oxygen to the rest of the body and carry back carbon dioxide to the lungs. **White blood cells** help the body defend against infections. **Platelets** are the reason why scabs form. They help to plug up the hole when a blood vessel breaks.

Blood Pressure

All human body cells need blood to survive. The heart pumps blood throughout the body to support life. **Blood pressure** is the force inside your blood vessels that pushes blood through your body.

Analogy: Think about a faucet that has water running through it.

- *Low pressure:* If there is only a trickle of water running through the faucet
- *High pressure:* If the faucet is blocked, then the water pipe will begin to leak, or maybe even break. The water pressure is too high.
- *Normal pressure:* Steady and normal amount of water flows through the faucet

What is high blood pressure?

High blood pressure, also known as **hypertension**, means there is too much force in the blood vessels, making your heart work harder to pump blood. If this condition continues over time without treatment, the blood vessel can clog or burst.



Why is high blood pressure prevention and treatment so important?

- High blood pressure over time can weaken organs or limbs. Examples:
Heart disease: Continuous high blood pressure weakens the heart's blood vessel walls
- High blood pressure increases the risk of clogged or burst vessels, which can cause the following serious medical conditions:
Stroke: Without blood flow and oxygen to the brain, brain and nerve cells die. Brain damage or death can occur.
Heart attack: Clogged blood vessel of the heart can cause a heart attack.

Talk with a partner. Answer the following questions based on the reading.

1. What are the three types of blood cells?
2. What is blood pressure?
3. Why is it important to prevent or treat high blood pressure?

Lesson 5: Cardiovascular and Nervous Systems / Hypertension

Reading Comprehension

Why is the Nervous System important? ¹

The nervous system is the control center of the body. It allows you to move, think and act the way you do. It coordinates the voluntary and involuntary actions of your body.

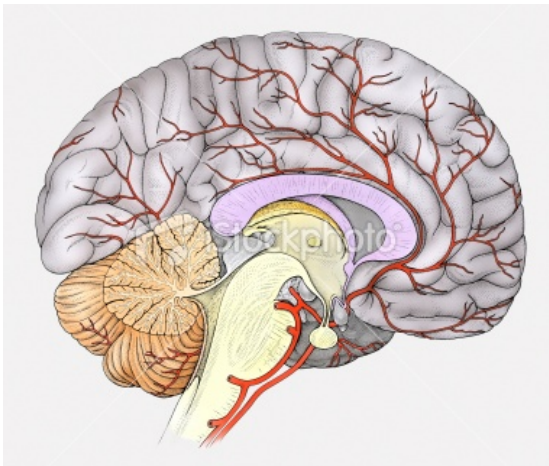
- **Voluntary action:** A voluntary action is an action you control. If you want to kick a ball, your brain sends a message to your leg to kick the ball
- **Involuntary action:** An involuntary action happens unconsciously. For example, you don't tell your body to digest food. Your body does it without you telling it to do so.

How the nervous system works

Neurons: Specialized cells (called nerve cells) receive and send signals throughout the body. *Analogy: A neuron is like a utility pole that receives and sends messages.*

Nerves: Nerves are collections of neurons that create a pathway for signals to travel between your brain and body. *Analogy: Nerves can be thought of as the collection of utility poles that work together to receive and send messages.*

Brain: The brain is very important in the nervous system and in the body. It controls all functions of the body. Without the brain, the body cannot function or survive. Each part of the brain is responsible for a specific part of the body. If a part of the brain is damaged (by a head injury or stroke, for example), other parts of the body may become disabled.



Write short answers based on the reading.

1. What is a neuron?

2. What are nerves?

3. Why is the brain an important part of the body?

Critical thinking skills:

1. Think about the question.
2. Talk about the answer with a partner.
3. Write a brief paragraph to answer the question.

Describe the difference between voluntary and involuntary actions.

¹ <http://www.youtube.com/watch?v=NL1S0AhYyFw>

Lesson 5: Cardiovascular and Nervous Systems / Hypertension

Definitions Match and Complete the Sentence

Cardiovascular System

Read each item. Write the letter from the column on the right that provides the correct definition. Use the Background Information reading to help you.

- | | |
|--------------------------------|---|
| 1. _____ Platelets | a. a body system that circulates blood in the body |
| 2. _____ Heart | b. a very strong muscle that pumps blood throughout your body |
| 3. _____ White blood cells | c. help the body defend against infections |
| 4. _____ Blood | d. carry oxygen back to cells |
| 5. _____ Red blood cells | e. the tubes that carry blood through your body |
| 6. _____ Blood vessels | f. help to plug up the hole when a blood vessel breaks |
| 7. _____ Cardiovascular system | g. fluid that carries oxygen, nutrients, waste and water to and from body cells |
| 8. _____ Blood pressure | h. the force inside your blood vessels that pushes blood through your body |

Use the words in the box to complete each sentence in the following passage about blood cells.

lungs	oxygen	carbon dioxide	white blood cells	platelets
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Red blood cells carry _____ to body cells. Once they have deposited oxygen in the body cells, they pick up body cells' _____ waste, which will eventually be removed through the _____.

_____ are very important in the immune system. They help the body defend against infections. They are responsible for detecting, weakening and attacking infections in the body.

_____ are the reason why scabs form when you have a scrape on your skin.

Lesson 5: Cardiovascular and Nervous Systems / Hypertension

Vocabulary Card Match

HEART	HEART ATTACK	a very strong muscle that pumps blood throughout the body	heart does not get enough oxygen due to clogged blood vessel
BRAIN	BLOOD VESSELS	part of the body that controls all functions of the body	tubes that carry blood throughout the body
BLOOD	RED BLOOD CELLS	fluid that carries oxygen, nutrients, waste, and water to and from body cells	carry oxygen back to cells
WHITE BLOOD CELLS	PLATELETS	help the body defend against infections	help to plug up the hole when a blood vessel breaks

Lesson 5: Cardiovascular and Nervous Systems / Hypertension

Vocabulary Card Match

STROKE	lack of blood flow and oxygen to the brain	HYPERTENSION	when there is too much force in the blood vessels, called high blood pressure
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Copy the words and their definitions after you match all of the cards.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Lesson 5: Cardiovascular and Nervous Systems / Hypertension

Conversation

Faduma is at the doctor's office for a routine checkup. The nurse is concerned because Faduma's systolic blood pressure (during heart beats) is 139, and her diastolic blood pressure (between heart beats) is 85. This is considered pre-hypertension. Normal blood pressure is less than 120/80.

Nurse: Hello, Faduma. I am concerned that your blood pressure is a little high. We call this pre-hypertension, because you are at risk of developing hypertension (high blood pressure).

Faduma: Oh, no. That's not good. I had no idea!

Nurse: Right--most people don't. There are no obvious symptoms of hypertension.

Faduma: Why is my blood pressure higher now than it used to be?

Nurse: Your blood pressure may go up as you get older. Blood vessels become less flexible as you age, which is why we suggest getting your blood pressure checked often.

Faduma: Yeah, I'm not very young anymore. Is there anything I can do to prevent it from getting worse?

Nurse: Eating more fruits and vegetables is good, and so is getting 30 minutes of physical activity a day.

Faduma: I know. But it's hard to find the time to exercise.

Nurse: We can work together to set an exercise goal for you, Faduma.

Faduma: Thanks. I'd like that.

Talk with your partner and write a short answer to the following question.

What did the nurse recommend for Faduma to improve her blood pressure?

Lesson 5: Cardiovascular and Nervous Systems / Hypertension

Quiz

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

- | | |
|--|---|
| <p>1. What is in blood?</p> <ul style="list-style-type: none">A. red blood cellsB. white blood cellsC. plateletsD. all of the above <p>2. Which of the following are involuntary actions?</p> <ul style="list-style-type: none">A. kicking a ballB. digesting foodC. reflexesD. both B and C <p>3. The nervous system:</p> <ul style="list-style-type: none">A. controls only voluntary actionsB. is the control center of the bodyC. none of theseD. is not important <p>4. How can you prevent high blood pressure?</p> <ul style="list-style-type: none">A. smokeB. diet and smokeC. become overweightD. eat a healthy diet, exercise and don't smoke | <p>5. Blood pressure is...</p> <ul style="list-style-type: none">A. the force inside your blood vesselsB. the force inside your bonesC. cholesterol in your veinsD. kidney disease <p>6. High blood pressure can lead to a stroke or heart attack.</p> <ul style="list-style-type: none">A. trueB. false <p>7. Which of these is a normal blood pressure?</p> <ul style="list-style-type: none">A. 130/83B. 141/92C. 115/80D. 129/89 <p>8. Write 3 things you can do to prevent high blood pressure.</p> <p>1. _____
_____</p> <p>2. _____
_____</p> <p>3. _____
_____</p> |
|--|---|

Student Survey: Cardiovascular/Nervous Systems Unit

1. Did you learn more information about cardiovascular 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 hypertension?

1	2	3	4	5
no		somewhat		yes

4. Do you know where to find more information about cardiovascular 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!