



Human Body Systems

Virtual Learning

9-12th PLTW[®] HBS

PLTW[®] 4.3.5 Smoking Can Cost You an Arm and a Leg

April 24, 2020



Human Body Systems

9-12th PLTW[®] HBS

Lesson: April 24, 2020

Objective/Learning Target:

Students will learn how simple measures of pressure in blood vessels can pinpoint problems in blood flow and how body systems work together to maintain blood pressure and volume. (*Reference: PLTW[®] 4.3.5 Smoking Can Cost You an Arm and a Leg*)



Let's Get Started/Warm Up Activities:

Before we start our lesson today, watch the following videos:

- [Top 10 Terrible Things Smoking Does to Your Body](#)
- [The Dangers of Vaping](#)



Lesson/Activity:

Watch this video:

[How Do Cigarettes Affect the Body?](#)

Activity #1: On a piece of paper or in your notebook, answer the following questions:

1. How does tar harm your body? Tar coats your teeth and leads to tooth decay.
2. What does cigarette smoke do to your nose? Over time, it will damage your nasal nerve endings causing someone to lose their sense of smell.
3. How does smoke hurt your lungs? The smoke damages the cilia in your lungs and fills the alveoli. This allows carbon monoxide to bind to red blood cells leading to oxygen deprivation and shortness of breath.

(Activity #1 continued on next slide)



Lesson/Activity continued:

Watch this video:

[How Do Cigarettes Affect the Body?](#)

Activity #1 continued:

4. What does nicotine do to your body? Increases dopamine levels in your brain causing addiction. Nicotine cause constriction and damage in blood vessels that can lead to clots and strokes.
5. Why are people who smoke more likely to develop cancer? The chemicals in cigarette smoke cause DNA damage which does not allow your body to repair itself as easily.
6. List three additional health problems associated with smoking.



Lesson/Activity continued:

Watch this video:

[How Blood Pressure Readings Work](#)

Activity #2:

- Watch the video above. On your piece of paper or in your notebook, write a step-by-step procedure of how to take take blood pressure. Make sure to have at least 5 steps in your procedure.
- Describe what systolic and diastolic pressures mean within your body.



Lesson/Activity continued:

Watch this video:

[How to Perform an Ankle Brachial Index](#)

Activity #3:

Watch the video above. On your piece of paper or in your notebook, write a step-by-step procedure of how to take an ankle brachial index (ABI). Make sure to have at least 5 steps in your procedure.



Lesson/Activity Answers:

Activity #1 answers: Click [HERE](#) to view the video.

1. How does tar harm your body? Tar coats your teeth and leads to tooth decay.
2. What does cigarette smoke do to your nose? Over time, it will damage your nasal nerve endings causing someone to lose their sense of smell.
3. How does smoke hurt your lungs? The smoke damages the cilia in your lungs and fills the alveoli. This allows carbon monoxide to bind to red blood cells leading to oxygen deprivation and shortness of breath.
4. What does nicotine do to your body? Increases dopamine levels in your brain causing addiction. Nicotine cause constriction and damage in blood vessels that can lead to clots and strokes.
5. Why are people who smoke more likely to develop cancer? The chemicals in cigarette smoke cause DNA damage which does not allow your body to repair itself as easily.
6. List three additional health problems associated with smoking. Answers will vary. Smoking can cause infertility, organ damage and worsening of asthma.



Lesson/Activity Answers:

Activity #2 Answer(s):

- Click [HERE](#) for a step-by-step procedure for taking blood pressure.
- Systolic pressure: The top number refers to the amount of pressure in your arteries during the contraction of your heart muscle.
- Diastolic pressure: The bottom number refers to your blood pressure when your heart muscle is between beats.

Activity #3 Answer(s):

- Click [HERE](#) for a step-by-step procedure for taking an ankle brachial index (ABI).



Practice:

Go to this website:

[How Cigarettes Affect the Body Quiz](#)

Practice #1: Take the quiz on how cigarette smoking can affect the body. Write down the questions and answers on your piece of paper or in your notebook.



Practice:

Go to this website:

[Peripheral Arterial vs. Peripheral Vascular Disease \(PAD & PVD\)](#)

Practice #2: Now that you have learned about ankle brachial index, watch the video above and explain how ABI could be used to determine PAD and PVD. Make sure to provide an explanation of the differences between PAD and PVD.

Practice Answers:

Practice #1 Answer(s):

Click [HERE](#) and take the quiz to see the answers.

The image shows a screenshot of a TED Ed quiz interface. At the top left is the TED Ed logo. Below it is a red navigation bar with the words "Discover", "Create", and "Support". Underneath the navigation bar is a progress indicator consisting of eight numbered circles, with the first circle (1) highlighted. The main content area contains a question: "Chemicals introduced into the body by smoking include all of the following EXCEPT:". Below the question are four multiple-choice options, each with a letter in a circle: A Nicotine, B Methemoglobin, C Arsenic, and D Carbon monoxide.

TEDEd

Discover Create Support

1 2 3 4 5 6 7 8

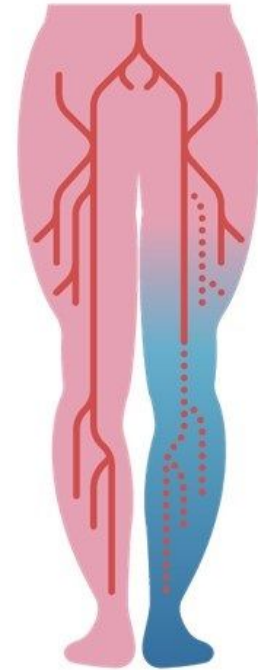
Chemicals introduced into the body by smoking include all of the following EXCEPT:

- A Nicotine
- B Methemoglobin
- C Arsenic
- D Carbon monoxide

Practice Answers:

Practice #2 Answer(s):

Click [HERE](#) to see how ABI is used to determine PAD and PVD.





Additional Practice and/or Resources:

Learn More:

[HBS Unit 4.3.5 Flashcards](#)

Test your knowledge of ankle brachial index (ABI) by clicking on the link above.

Additional Resources to Explore:

- To learn more about the effects of smoking on the respiratory system, click [here](#).
- This [article](#) from the National Heart Lung and Blood Institute explains how smoking affects the heart and blood vessels.
- Click [here](#) to find in-depth information on smoking cessation, including strategies on how to quit.
- This [video](#) by the educator also provides information on the cessation of smoking.
- Check out this [brief review](#) of nicotine replacement therapy.