

The Nose

By Jennifer Kenny

Did you ever hear the expression, "It's as plain as the nose on your face?" A nose can be a real focal point on a person's face. It's often one of the most noticeable features. Noses come in all shapes and sizes. How appropriate then that the nose is such an important part of the respiratory system.

The nose is the first workstation in the respiratory system. It is the entrance to the respiratory system. It makes incoming air warm, moist, and clean. It is also essential to the sense of smell.

The nose itself is made of curved plates of cartilage. The two entrance holes, or nostrils, of the nose are held open by these plates. The septal cartilage runs in the middle of the nose, separating the nasal cavity, or air chamber. Skull bones form the roof, sides, and floor of the nasal cavity.

The nostrils open in the front of the nose where we can see the opening, but they also open in the back, past the rear of the mouth into the pharynx, or throat. Because of the openings, air can go in and out of the nasal cavity.

The inner lining of the nasal cavity is called the nasal mucosa. It is soft and moist. A lot of blood flows through it so it is warm and red. The nasal mucosa constantly makes mucus so that it doesn't dry out. The sticky mucus also traps the particles of dirt that you don't want entering the rest of your respiratory system. The mucus slowly goes down the throat to be swallowed, but if you have a cold and are producing too much mucus, you can just blow it out.

When scientists viewed the human skull to study it, they noticed that there's always a hole where the nose is supposed to be. That's because the nose is made up of cartilage, not bone. The septal cartilage divides the nasal cavity in half. The upper sides of the nose are made of lateral nasal cartilages. The lower side is made of the major alar cartilage. Behind this, there are minor alar cartilages.

Now that you know about the structure of the nose, where does its other function come in? Well, of course, you know, your nose allows you to smell. This may seem simple enough, but the sense of smell is actually important to your survival. Think about it. Your sense of smell helps you to make sure the foods and drinks you have aren't bad. Your sense of smell also warns you in case there's a fire. On a lighter note, your sense of smell also gives you a sense of pleasure and enjoyment. How does it all happen?

Well, there are two olfactory epithelia in the lining of the nasal cavity. They detect smell. Each of them contains millions of olfactory cells and long hairs called cilia. The smells come from tiny odor molecules floating in the air. The odor molecules land in the cilia where the olfactory receptor cells send nerve signals to the brain. Think of these cells as antennae reaching out for odor particles! The average person can detect 10,000 different smells. You notice important, new smells and then the smell fades quickly as a result of habituation. (Habituation means you have gotten used to or accustomed to something.)

Your nose plays another important role, too. It helps you speak. Does that make any sense? In actuality, the air flowing through your nose gives more sound quality and feature to your voice. Your nose has sinuses, or holes set into the skull bones. There are four pairs of sinuses - ethmoidal sinuses, frontal sinuses, sphenoidal sinuses, and maxillary sinuses. The sinuses connect to the main nasal cavity and affect the sounds of speech and give your voice more character. (They also help make the bones in your head lighter!)

Now that the nose has detected smell, cleaned, and moistened the air, and given some color to your speech, the air is ready to leave and move on to the rest of the respiratory system.



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The Nose

Questions

- _____ 1. The _____ is the first workstation in the respiratory system.
- A. nose
 - B. bronchi
 - C. lung
- _____ 2. Which is NOT a function of the nose?
- A. The nose helps you to smell.
 - B. The nose helps food particles enter the digestive system.
 - C. The nose traps particles of dirt from air.
 - D. The nose lets air enter the respiratory system.
- _____ 3. What is another word for your throat?
- A. trachea
 - B. pharynx
 - C. larynx
- _____ 4. Your nose is made of _____.
- A. cartilage
 - B. bone
- _____ 5. The average person can detect _____ different smells.
- A. 1,000
 - B. 100,000
 - C. 10,000
- _____ 6. Your nose has four pairs of _____, or holes set into the skull bones.
- A. sinuses
 - B. cilia
 - C. olfactory epithelia
- _____ 7. Sinuses make the bones in your head lighter.
- A. false
 - B. true
8. My mother walked into the room. I knew that without seeing her because I could smell her perfume. After speaking with her awhile, though, I didn't notice the smell anymore. Why?

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Thursday, May 1



Date _____

Our Respiratory System

By Jennifer Kenny

Each day you breathe in and out whether you are awake or asleep. You don't have to think about it. It occurs every few seconds, every day, during every part of your life. You can't live without breathing. You need oxygen from the air you breathe to live and grow. Breathing takes the air into the lungs and allows the air to be pushed out again.

Well, we know breathing is important, but what is important in the air we breathe? Even ancient people knew that living things needed air to live, but they weren't sure what air really was. In 1643, Evangelista Torricelli proved that air wasn't a spirit. It had weight and took up space. In 1771, Cart Scheele discovered the very important ingredient, oxygen, in air. Scientists continue to study air, oxygen, and breathing even today.

Air, we know now, is actually a combination of colorless gases. Four-fifths of air is nitrogen. One-fifth of air is oxygen. There's also some carbon dioxide, water vapor, dust, pollen, and other particles in air.

Today we also know that there are two kinds of respiration occurring in our body. One is the kind we usually think of- the breathing in and out of air through our lungs. The other kind is cellular respiration. It occurs in the cells in our body. Energy to live comes from the releasing of energy when food materials and oxygen go through chemical changes so that energy is released from the digested foods. To have this occur in our cells, though, the oxygen has to get there first. So let's go back to the beginning.

Your nose and your mouth are the gateways to your respiratory system. The air then goes to the trachea. The trachea is a passageway leading to the lungs. The epiglottis guards the trachea so food can't get down it.

At the top of the trachea is your voice box, or larynx. This is also considered part of the respiratory system. The two stretchy bands, or vocal cords, move when air flows over them, thereby creating sounds. Wow!

Equally important, though, is the fact that the trachea branches into bronchi. One goes to the left lung; one goes to the right.

The bronchi branch into smaller passageways called bronchioles. The air-filled sacs at the end are called alveoli. They are grouped like grapes and there are millions of them. Oxygen passes through the thin walls of the alveoli into your bloodstream so it can be transported throughout the body. Carbon dioxide is also taken from the blood into the alveoli so it can be breathed out.

Your diaphragm is below your lungs. It is a muscle shaped like a dome. It moves up and down. When you breathe in, your diaphragm moves down and other chest muscles pull your ribs out and up. Your lungs can then fill with air. When you breathe out, your ribs and diaphragm press inward and air is squeezed out of your lungs.

Your ribs make up the cage of bones in your chest cavity that protect your lungs. Your left lung is actually smaller than your right lung so that it allows room for your heart.

Well, obviously these very important parts of our body need to be protected so they can work, but even serious scientists can see some humor in the situation. So many of them thought that our airways look like a tree in our body that they nicknamed our airways just that - a pulmonary tree. The trachea is the trunk. The bronchi are the branches. The bronchioles are the twigs. What a fun way to help remember these complicated pieces!

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Our Respiratory System

Questions

- _____ 1. Ancient people understood there was oxygen in air.
- A. true
 - B. false
- _____ 2. Breathing is voluntary.
- A. false
 - B. true
- _____ 3. About what fraction of air is made of oxygen?
- A. $\frac{1}{5}$
 - B. $\frac{2}{5}$
 - C. $\frac{4}{5}$
- _____ 4. How many kinds of respiration occur in your body?
- A. only 1
 - B. 2
 - C. 4 or more
- _____ 5. Another word for your voicebox is _____.
- A. epiglottis
 - B. trachea
 - C. pharynx
 - D. larynx
- _____ 6. Which statement is true?
- A. There is no dirt in air.
 - B. There are millions of alveoli and they are grouped like grapes.
 - C. The epiglottis lets food enter the trachea.
 - D. The larynx is not part of the respiratory system.
- _____ 7. How many lungs do you have?
- A. 7
 - B. 2
 - C. millions
 - D. 1
- _____ 8. From the last paragraph, what can you infer pulmonary means?
- A. relating to the heart
 - B. relating to nature
 - C. relating to the lungs

Mucus, Boogers, and Snot - How GROSS!

By Joyce Furstenau

"Quit picking your nose." Ever hear your mom say that? Why do we pick our noses? Everyone does it. Most people think it's best to do it in private. Even blowing your nose in a tissue is not done in front of others in polite company. Whether its blowing your nose or picking it, we all need to clean out our noses often.

Our nose is lined with a MUCOUS (*mew-kuss*) membrane. This membrane makes (what else?) mucous, which is also called PHLEGM (flem).

In the nose, mucous has two roles. Inside the nose are tiny hair-like projections called CILIA (*sill-ee-uh*). The nose hairs (cilia) trap dust, pollutants, bacteria, and other small particles we breathe in. The mucous acts like a sticky doormat that helps trap the finer particles before they go too far. The mucous and hairs work together like a vacuum cleaner to keep these particles from entering your lungs. The watery mucous also acts like a shower in your nose, cleaning out dead skin cells, particles, and dust. Mucous also adds moisture to the air you breathe in and keeps your nasal tissues from drying out. Blowing your nose is like emptying the vacuum bag.



Boogers are actually dried-up snot and dirty nose debris. They can be small, slimy lumps or big, dry, brown clumps. Either way, boogers are filled with the junk that's in the air you breathe. YUCK!

The snot that's cooked up inside your mucous membranes is produced by GOBLET CELLS. Mmmm, how about a goblet full of mucous? Doesn't sound good? Surprise! You swallow about two cups of snot every day. Actually, this mucous is about 95 percent water, two to three percent salt, and two percent MUCIN (*mew-sin*). The average human body produces about a liter of mucus per day.

As gross as this sounds, mucous is actually one of the best friends your body has. Mucous is in many other parts of your body, too. Your body has mucus membranes in all sorts of places; the stomach, intestines, nose, lungs, eyes, mouth, and the urinary tract all contain membranes that make mucus. If it weren't for the mucous in your stomach, it would eat itself up!

Sneezing is another way that mucous helps you. When you sneeze, it's because your cilia have been super-irritated by such things as cold germs, pet dander, plant pollen, or other irritants. Your body can't wait to get rid of these things the usual way so it sneezes them out. Some sneezes have been clocked at over 100 miles per hour. Unfortunately, this spray of snot is filled with all sorts of germs. Some of these germs can travel across the room. Some can float in the air for almost an hour. So, sneeze into your sleeve, please!

Why does your nose run and your feet smell? We'll leave the smelly feet for another time, but your nose can run for several different reasons. One reason is because it's cold outside. Remember that mucous is 95 percent water. When it's chilly, the water in your nose and your breath condenses. The condensed moisture forms heavy drops, which can run out your nose, over your chin, and drop all the way to your shoe.

Other times, the germs you breathe in can actually start growing in your nose, throat, and lungs, and you have a cold. YUCK! When you have a cold, the linings of your nose and throat swell. Thick, clear liquid called mucus forms, and its purpose is to wash away the germs. The mucus builds up and blocks the air passages. This is what causes a stuffy nose and a cough. Sometimes you may need to see a doctor if your cold does not get better. Sometimes, it's not a cold at all but allergies. You may also need to see a specialist to help you determine what is causing your runny nose.

Your nose is an important part of your sensory system. When everything works well, your nose can give you

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great pleasure. Just try not to digitally manipulate your nasal passages. In other words, "Don't pick your nose!" It's definitely not cool.

Mucus, Boogers, and Snot - How GROSS!

Questions

1. What does the mucous membrane make?

2. What is another word for mucous?

3. What are the tiny nose hairs called?

_____ 4. Dried up snot is called what?

- A. cilia
- B. mucous
- C. phlegm
- D. boogers

_____ 5. Mucous is about 95 percent water, two to three percent salt, and two percent what?

- A. mucin
- B. cilia
- C. salt
- D. water

_____ 6. How fast can a sneeze travel?

- A. up to 5 miles per hour
- B. up to 100 miles per hour
- C. up to 75 miles per hour
- D. up to 25 miles per hour

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Monday, May 5



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Respiratory System

By Sharon Fabian

All of the systems in your body work together. Each system has its own job to do, but each system also depends on the others. You will see how this works as you learn about the respiratory system.

The respiratory system is the system that takes in air, separates out the oxygen that you need to live, and gets rid of the carbon dioxide that is left. It includes your nose, nasal passages, windpipe, lungs, and diaphragm. Every minute, your respiratory system breathes in about thirteen pints of air.

It starts with your nose. You inhale fresh air about twenty times every minute. The air is drawn through your nasal passages, which clean the air by filtering out particles that you wouldn't want in your lungs. Mucus takes care of this part of the job. That's why it's so sticky, to capture unwanted stuff in the air. Sometimes, when your nose feels like getting rid of this yucky stuff fast, you sneeze.



After you breathe air in through your nose, it travels down your windpipe, also called the trachea. Since your windpipe is right beside the pipe that your food goes down, it has an interesting feature; a little flap called the epiglottis that can close really quickly to keep food from getting into your windpipe.

Below your ribs, your windpipe splits into two parts, which attach to your two lungs. Your left lung is a little smaller than your right one, to leave space for your heart. Your lungs fill up most of the space in your ribcage. Here is one example of your systems helping each other out. Your rib cage protects your lungs.

Your lungs are pink, spongy organs. Inside each of them there are tubes, called bronchi, that branch out into smaller and smaller tubes. They must get really small, because all together you have about 1,500 miles of airway tubing! At the very end of the tubes are tiny sacs called alveoli. You have about 300 million of these!

In the tiny air sacs is where the chemical exchange, oxygen for carbon dioxide, takes place. The air sacs give up their oxygen into the blood stream, which at about the same time, gives up its carbon dioxide to the air sacs. The blood was a dark color when it arrived, but now it's leaving bright red again, thanks to its new supply of oxygen. Here is another example of your systems working together, the respiratory system and the circulatory system. The blood carries the oxygen on its way, and now the lungs have a new job, to send the carbon dioxide up to your nose to be exhaled.

A dome-shaped muscle just below your lungs, called the diaphragm, makes your lungs breathe in and out. When your diaphragm pulls down, it leaves space for your lungs to expand, and air pressure brings more air in. When your diaphragm relaxes, the space gets smaller and air is pushed out.

Your respiratory system is in communication with another system, your nervous system, too. Your brain, which is part of the nervous system, tells your lungs when it needs to breathe faster or slower. For example, if you are running, your lungs need to know to breathe faster to bring in more oxygen.

On its way out, the air passes over your vocal cords. This is where you make sounds to talk, sing, laugh, or yell, but that's another story. So the carbon dioxide goes out the same way the oxygen came in, and that's how your respiratory system works.

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Respiratory System

Questions

- _____ 1. The average person breathes about _____ times per minute.
- A. 5
 - B. 300 million
 - C. 1,500
 - D. 20
- _____ 2. Another name for your windpipe is your _____.
- A. bronchi
 - B. epiglottis
 - C. alveoli
 - D. trachea
- _____ 3. Your _____ protects your lungs.
- A. shirt
 - B. ribcage
 - C. skin
 - D. heart
- _____ 4. The respiratory system brings in a chemical that we need, and gets rid of a chemical that we don't need. Name the two chemicals.
- A. carbon and nitrogen
 - B. oxygen and carbon dioxide
 - C. carbon dioxide and neon
 - D. nitrogen and oxygen
- _____ 5. The diaphragm is a _____.
- A. muscle
 - B. tube
 - C. chemical
 - D. cell
- _____ 6. Your respiratory system works along with which other systems?
- A. nervous system and circulatory system
 - B. skeletal system and muscular system
 - C. both a and b
 - D. neither a or b
- _____ 7. Your brain is part of your _____ system.
- A. skeletal
 - B. circulatory
 - C. respiratory
 - D. nervous

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- _____ 8. Your ribcage is part of your _____ system.
- A. skeletal
 - B. respiratory
 - C. nervous
 - D. circulatory

Keeping Your Respiratory System Healthy

By Brandi Waters

Breathing is something that you do every minute of every day. You do it from the moment you are born until the moment you die. Breathing keeps you alive. Your respiratory system includes all of the parts of your body that help you breathe. It includes your nose, throat, windpipe, voice box, and lungs, as well as other parts and muscles that help the respiratory system do its job. Your respiratory system works hard and does a very important job. Shouldn't you do all that you can to keep it healthy? The good news is that it is easy to take care of your respiratory system. The most important thing that you can do is to NOT do something! Don't smoke. Cigarette smoke is full of harmful chemicals and sticky substances. It coats your lungs and the tiny hairs, called cilia, throughout your respiratory system. Not only is this gross, it also keeps your respiratory system from working at its best. If you smoke for many years, your respiratory system could stop working at all! Do yourself a favor and don't smoke. Exercise is something that you can do to keep your respiratory system healthy. Exercise makes your lungs work harder. This makes them stronger, just like lifting weights makes your muscles stronger.



Keeping Your Respiratory System Healthy

Questions

- _____ 1. _____ is the main function of the respiratory system.
- A. Thinking
 - B. Breathing
 - C. Speaking
 - D. all of the above
- _____ 2. The _____ is a part of the respiratory system.
- A. voice box
 - B. esophagus
 - C. tongue
 - D. heart
- _____ 3. Cigarette smoke forms a sticky coating over the _____ in the respiratory system.
- A. blood vessels
 - B. cilia
 - C. nose
 - D. nicotine
4. What is the most important thing that you can do to keep your respiratory system healthy?
