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Marvels of Mucus and Phlegm

The Slime That Keeps You Healthy

Mucus has several names. Snot, the sticky goo that pours from your nose during a cold. Or phlegm, the gunk that can clog your lungs and make you cough. You probably aren't a fan of the stuff. But mucus is so much more than a runny nose. Your body is making mucus all the time. And it plays an important role in keeping you healthy.

"Mucus and phlegm get sort of a bad reputation," says Dr. Richard Boucher, a lung expert at the University of North Carolina. "People think about it as something you're supposed to cough up and get out. That it's a bad thing. But in truth, mucus really is the interface between you and the outside world."

Mucus lines the moist surfaces of your body like the lungs, **sinuses**, mouth, stomach, and intestines. Even your eyes are coated with a thin layer of mucus. It serves as a lubricant to keep tissues from drying out. It's also a line of defense.

"Mucus is very important for filtering out materials that you breathe in through your nose, such as dust and allergens and microorganisms," says Dr. Andrew Lane, an ear, nose, and throat expert at Johns Hopkins University. "Anything that you breathe in gets stuck in the mucus, like flypaper."

Mucus at Work • In the next hour, you're going to inhale thousands of bacteria. But you'll never know it. Bacteria land on the mucus-lined surface of the lungs and get trapped. Then little hairs called cilia go to work. They push the mucus up and out of the lungs with all the trapped bacteria, viruses, and dust.

"It comes up at sort of a nice slow rate to the back of the throat," Boucher says. "And if you're normal and healthy, you never feel it and you just swallow it."

The mucus, together with the bacteria and other trapped substances, then goes to the stomach and eventually pass out of the body.

Your body makes a lot of mucus, although no one's quite sure how much. Mucus is mostly water. But it also contains special proteins, sugars, and molecules that help the body control harmful germs.

Usually you're not aware of all the mucus that slowly flows through your body. That is, until you get sick.

Too Much Mucus • You usually only notice mucus when you're making too much of it. Or if it changes consistency.

An infection can make mucus thicker and stickier. Infections also lead to **inflammation** in the mucous membranes that line the nose and the rest of your airway. This can cause certain airway **glands** to make more mucus. That mucus can get thick with bacteria and cells that arrive to fight the infection. That can stimulate even more mucus production.

"When mucus is particularly excessive, it can be bothersome

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Definitions

Sinuses
The hollow spaces in your skull around your nose, eyes, and forehead.

Inflammation
Heat, swelling, and redness caused by the body's protective response to injury or infection.

Glands
Organs that produce and release substances into the body.

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in terms of runny nose, clogged nose, and post-nasal drip," says Dr. Bruce Bochner, an allergy expert at Northwestern University. Post-nasal drip is when excess mucus from the back of the nose gathers and drips down the back of the throat. It's a common cause of a cough.

Allergies can also cause your body to make extra mucus. When you have an allergy, your **immune system** overreacts to a harmless substance, like pollen, dust, or animal dander. Cells in your airway then release substances, like histamine.

Histamine can make you sneeze. It also causes the mucous membranes in the nose to swell and the glands to make more mucus. Bochner's team studies how certain proteins on immune cells control allergies and inflammation. They're also looking at how certain components of mucus might help fight inflammation.

Definitions

Immune System

The system that protects your body from invading viruses, bacteria, and other microscopic threats.

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Editor Harrison Wein, Ph.D.

Managing Editor Tianna Hicklin, Ph.D.

Graphics Alan Defibaugh (illustrations), Bryan Ewsichek (design)

Contributors Erin Bryant and Heather Martin

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National Institutes of Health
NIH...Turning Discovery Into Health®

Office of Communications & Public Liaison
Building 31, Room 5B52
Bethesda, MD 20892-2094
email: nihnewsinhealth@od.nih.gov
phone: 301-451-8224

"There are two general types of secretions that that are made in the nose," Bochner explains. Things like allergies, eating spicy food, and being outside in the cold can result in a more watery nasal leakage.

Your body usually makes thicker mucus when you have a cold (caused by viruses) or sinus infection (caused by bacteria).

Most mucus problems are temporary. But producing too much mucus contributes to some serious conditions. This includes cystic fibrosis, a genetic disorder that causes mucus in the lungs to become thick and glue-like. Boucher and his colleagues are working to find new treatments for cystic fibrosis and related lung diseases.

Colors of Mucus • Mucus can come in a range of colors. This won't surprise you if you've ever looked closely at your tissues after blowing your nose.

Mucus is normally clear. During a cold, you may find that your snot is cloudy or yellowish. Proteins released by the cells that cause inflammation can get stuck in the mucus and give it this color, Lane explains. He's currently studying how cells in the nose and sinus are involved in long-term inflammation, called chronic sinusitis.

Brown or black mucus is more common in heavy smokers and some types of lung disease. Greenish, brownish, or bloody colors may signal a bacterial infection.

But that's not always the case. It can be difficult to figure out what's wrong simply by your mucus color. Since many things can cause your body to make too much mucus, doctors rely on other clues to diagnose and treat the problem.

Wonders of Mucus • While excess snot and phlegm aren't pleasant, you wouldn't want to go without mucus.

"Mucus creates a layer of protection between the outside world and you. So it's very, very important," Lane says.

It's not just important for people. It's also the slime that allows a snail to move across the ground. It's the slippery coating that protects fish against bacteria in the water. "It's a really wonderful material," Boucher says.

But maybe your mucus isn't feeling so marvelous. If excess mucus is getting you down, see the Wise Choices box for tips on getting rid of it. ■

Wise Choices

When There's Too Much Mucus

- **Use a humidifier or vaporizer.** Keeping your nose and throat moist may reduce mucus and phlegm production.
- **Apply a warm, moist washcloth to your face.**
- **Try a nasal saline spray or rinse.** Clearing out mucus can help you breathe easier. Commercial products are available. If making your own, only use distilled, sterile, or previously boiled water.
- **Consider taking over-the-counter medications.** Expectorants can thin mucus to help clear it from your chest. Decongestants shrink blood vessels, so you produce less mucus. (Be careful about overusing them, as they can make the problem worse.) Antihistamines can help if your mucus is caused by allergies.
- **Talk with your health care provider** if your runny nose or congestion lasts more than three weeks or occurs with a fever.

Web Links

For more about mucus and phlegm, see "Links" in the online article: newsinhealth.nih.gov/2020/08/marvels-mucus-phlegm

Chronic Disease in Uncertain Times

Be Prepared and Plan Ahead

Coping with emergencies is challenging in the best of situations. During the coronavirus pandemic, many of us are just trying to get by each day. For people with chronic (long-term) health conditions—like diabetes and chronic kidney disease—the challenges can be even greater. But with planning, you can prepare what you'll need to make things more manageable.

"Thankfully, people with chronic medical conditions have tools to help maintain their health, even during difficult times," says Dr. Griffin P. Rodgers, director of NIH's National Institute of Diabetes and Digestive and Kidney Diseases. Managing these conditions well can help lower your risk for complications and other diseases.

Keeping on top of health problems can take extra effort during uncertain times. First, be sure to follow the CDC's latest public health guidance. That awareness is especially important in a pandemic. As we've seen with COVID-19, information about new diseases can quickly change.

Rodgers also says it's important to keep in touch with your health care providers. They can help you to adapt and maintain your normal disease management plans.

Be sure to eat well and safely participate in physical activity as much as possible during these difficult times. That can help you prevent or delay health problems.

Some people with chronic conditions need to follow a special nutrition plan. For example, people with diabetes should follow a healthy eating plan prescribed for blood sugar control. Talk with your health care provider about your physical activity and eating routines.

Eating healthy and staying active can also help lower stress. Coping with uncertainty is stressful for anyone. People with health conditions may feel more stress when their normal routine and health care are disrupted.

There are many ways to lower stress and relax. Ideas include deep breathing, taking a walk, meditating, listening to music, or doing a hobby. Getting enough sleep (seven to eight hours each night) can have tremendous health benefits, including helping to reduce stress and control weight.

Your health care provider can help you find ways to lower your stress and screen for anxiety and depression. Depression is common among people with a chronic illness. And it can get in the way of managing the condition.

"Ask for help if you feel down or need help managing stress," Rodgers says. "It's always important to learn ways to lower stress and improve health."

Preparing for the unexpected will help you manage a chronic health condition during a crisis. Consider packing a specialized "go-kit" for emergencies. See the Wise Choices box for what to include.

Maintaining your health doesn't erase the risk for getting other diseases. But each healthy day is a day closer to better treatments for diseases. NIH is making a coordinated effort to help advance research on preventing, diagnosing, and treating COVID-19.

Contact your health care provider with any questions or concerns about how to prepare for natural disasters and emergencies. ■

Wise Choices

Preparing For Disasters With a Chronic Disease

Create a "go-kit" for emergencies:

- At least one week's worth of medical supplies and equipment.
- Contact information for health care providers and emergency contacts.
- A medication list with doses and dosing schedules.
- A list of your allergies.
- Information about any medical devices you use.
- At least a three-day supply of any foods needed to manage your condition.
- Copies of your insurance card and photo ID.
- Copies of recent lab work you might need.

Web Links

For more about managing chronic diseases, see "Links" in the online article: newsinhealth.nih.gov/2020/08/chronic-disease-uncertain-times

Health Capsules

For links to more information, please visit our website and see these stories online.

Tracking Symptoms After Brain Injury

A fall, car accident, or sports injury can cause a mild traumatic brain injury, or concussion. Most people will recover in a few weeks to months. But some people's symptoms continue long afterward.

Researchers want to better understand why some people's brains don't heal after a concussion. This condition is called post-concussive syndrome. It may involve headaches, fatigue, or dizziness. You can also have problems with concentration. Some develop mental health conditions, like depression or post-traumatic stress disorder (PTSD).

A research team looked for ways to predict who will have long-term problems after a brain injury. They examined blood samples for signs of concussions. Such compounds are called biomarkers. The study included almost 200 military veterans. Their blood was tested for a protein called NfL (for neurofilament light chain). NfL is known to be released by damaged brain cells.

Researchers compared veterans who never had a brain injury, those who had one or two, and those with three or more. People who had three or more brain injuries were more likely to have higher levels of NfL. The veterans with more symptoms of post-concussive syndrome, PTSD, or depression were also more likely to have higher levels of NfL.

"This study brings us closer to identifying biomarkers to predict risk for PTSD, depression, and similar conditions in military personnel and others who have experienced a traumatic brain injury," says Dr. Jessica Gill, an NIH expert on brain injury who led the study. ■

Finding Reliable Health Information Online

Many people get health information from the internet. But not every online source is reliable. How do you know whether you can trust the health information you find? There are many signs you can look for.

First, it's important to find out if a website is from a trusted source. Health websites sponsored by the federal government are a good place to start. Their web addresses will be followed by ".gov." Well-known medical schools and large professional organizations can also be good sources of health information.

For other sites, it's important to ask a few questions. Who sponsors the website and what are their goals? They may be trying to sell you a product rather than inform you. Find out who wrote and reviewed the information. Are they a medical professional? Be cautious about any website offering a quick fix or "miracle cure" for your health problem.

It's also important to note when the information was written. Often there will be a date on the bottom of the webpage. You don't want to make decisions based on out-of-date information.

Social media sites like Facebook and Twitter are another source of health information. But be mindful—just because a post is from a friend or colleague doesn't mean it's true or scientifically accurate. Check the original source to decide for yourself.

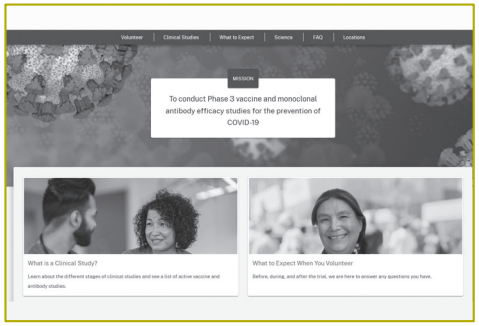
No information you find online should replace seeing a medical professional. For more tips on finding reliable health information, visit: www.nia.nih.gov/health/online-health-information-it-reliable. ■

Featured Website

COVID-19 Prevention Network

www.coronavirusprevention network.org

Researchers are working to find safe and effective vaccines for COVID-19. They are also testing other ways to protect people from the virus. Learn more about coronavirus clinical trials, including how to volunteer.



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