

NIH News in Health

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Understanding COVID-19 How To Protect Yourself During the Pandemic

COVID-19 has claimed millions of lives around the world. But we learn more about this disease every day. Scientists are developing tools that promise to slow and eventually help us overcome the pandemic.

COVID-19 is caused by a new coronavirus called SARS-CoV-2. There are many types of coronaviruses. Some cause the common cold. Others have led to fatal disease outbreaks. These include severe acute respiratory syndrome (SARS) in 2003, Middle East respiratory syndrome (MERS) in 2012, and now COVID-19.

Coronaviruses are named for the crown-like spikes on their surface. (Corona means crown.) The viruses use the spikes to help get inside your body's cells. Once inside, they replicate, or make copies of themselves.

Scientists have learned how to turn these spikes against the virus through vaccines and treatments. They've also learned what you can do to protect yourself from the virus.

Protecting Yourself • You're most likely to get COVID-19 through close contact with someone who's infected. Coughing, sneezing, talking, and breathing produce small droplets of liquid. These are called respiratory droplets. They travel through the air and can be inhaled by someone else.

"COVID-19 is spread mainly through exposure to respiratory droplets that tend to drop within six feet," says Dr. Anthony Fauci, director of NIH's National Institute of Al-



lergy and Infectious Diseases. That's why it's important to stay at least six feet (about two arm lengths) away from people who don't live with you.

"Surfaces can be contaminated. But it is likely that this is a less common cause of infection rather than person-to-person directly," Fauci says.

You can protect yourself and others by wearing a mask. Choose one that has at least two layers of fabric. Make sure that the mask covers your mouth and nose and doesn't leak air around the edges.

"There's very little transmission in places where masks are worn," says Dr. Ben Cowling at the University of Hong Kong who studies how viruses spread. Cowling found that infections were most often spread in settings where masks aren't worn.

"Masks work. But even with mandatory masking, you still need social distancing as well," he says. You can lower your risk by avoiding crowds. Crowds increase the risk

of coming in contact with someone who has COVID-19.

What to Look For • Common symptoms of COVID-19 include fever, cough, headaches, fatigue, and muscle or body aches. People with COVID-19 may also lose their sense of smell or taste. Symptoms usually appear two to 14 days after being exposed to the virus.

But even people who don't seem sick can still infect others. The CDC estimates that 50% of infections are spread by people with no symptoms. While some with this virus develop life-threatening illness, others have mild symptoms, and some never develop any.

Catching the virus is more dangerous for some groups of people. This includes older adults and people with certain medical conditions. These medical conditions include obesity, diabetes, heart and lung disease, and asthma. About 40% of Americans have at least one of these risk factors.

Getting Treatment • Better COVID-19 treatments mean that fewer people now get severely sick if they catch the virus. Scientists have been working to test available drugs

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against the virus. They've found at least two that can help people who are hospitalized with the virus.

A drug called remdesivir can reduce the time a patient spends in the hospital. A steroid called dexamethasone helps stop the **immune system** from reacting too strongly to the virus. That can damage body tissues and organs.

Antibody treatments are also available. Antibodies are proteins that your body makes to fight germs. Scientists have learned how to make them in the lab. Antibody treatments can block SARS-CoV-2 to prevent the illness from getting worse. They seem to have the most benefit when given early in the disease.

"Antibody treatments really do have the potential to help people, especially for treating individuals who are not yet hospitalized," says Dr. Mark Heise, who studies the ge-

Definitions

Immune System

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

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netics of viruses at the University of North Carolina at Chapel Hill. Heise is working to develop mouse models to test treatments and vaccines.

Studies are now testing combinations of treatments. "Combining drugs that target both the virus and the person's immune response may help treat COVID-19," says Heise. Scientists are also looking for new drugs that better target the virus.

A Shot of Hope: Vaccines • It used to take a decade or more to develop a new vaccine. In this pandemic, scientists created COVID-19 vaccines in less than a year.

The first two vaccines approved for emergency use are from Moderna and Pfizer/BioNTech. Moderna's vaccine was co-developed with NIH scientists. Both are a new type of vaccine called mRNA vaccines. mRNA carries the genetic information for your body to make proteins.

The vaccines direct the body's cells to make a piece of the virus called the spike protein. These proteins can't cause illness by themselves. But they teach your immune system to make antibodies against the protein. If you encounter the virus later, the antibodies provide protection against it.

The mRNA vaccines now available were shown to be more than 90% effective in large clinical trials. They can cause side effects—such as fatigue, muscle aches, joint pain, and headache. But both vaccines were found to be safe in the clinical trials.

"Get vaccinated. The vaccines are safe. They're incredibly effective," says Dr. Jason McLellan, an expert on coronaviruses at the University of Texas at Austin. McLellan's research was critical in developing these vaccines. His team, along with NIH scientists, figured out how to lock the shape of the spike protein to make the most effective antibodies.

As the pandemic has gone on, new



Wise Choices

Think You Might Have COVID-19?

- **Stay home except to get medical care.** Even if you don't feel sick, you can spread COVID-19 to others.
- **Isolate yourself from others in your household.** Stay in a separate room and use a different bathroom, if possible.
- **Contact your health care provider.** Monitor and tell them about your symptoms.
- **Visit your state or local health department's website** to find testing information in your area.
- **Get care immediately if you are having trouble breathing or pain in your chest.**
- **Visit [coronavirus.gov](https://www.cdc.gov/coronavirus)** for more information.

versions of the virus, or variants, have appeared. "We're all very confident that vaccines will continue to work well against these variants," McLellan says. "Vaccination also helps stop the development of new variants, because it provides fewer opportunities for the virus to change as it replicates."

Many people will need to be vaccinated for the pandemic to end. Fauci estimates that 70% to 85% of the U.S. population will need to be vaccinated to get "herd immunity." That's the point where enough people are immune to the virus to prevent its spread. That's important because it protects vulnerable people who can't get vaccinated.

"It is my hope that all Americans will protect themselves by getting vaccinated when the vaccine becomes available to them," Fauci says. "That is how our country will begin to heal and move forward." ■



Web Links

For more about COVID-19 disease, see "Links" in the online article: newsinhealth.nih.gov/2021/03/understanding-covid-19

Patchy Skin

Vitiligo Explained

Your skin is often the first thing other people see. You may have noticed that some people have patches of white skin. This discoloring is called vitiligo.

Vitiligo isn't contagious. It's an autoimmune disease. That's a condition in which the body's immune system mistakenly attacks and destroys the body's own cells.

Normally, your immune system defends your body from germs. But in vitiligo, immune cells kill the cells that produce the skin's color. These pigment cells are called melanocytes.

Sometimes, vitiligo causes areas of hair to go white as well. People with vitiligo may also develop **inflammation** in the eyes or ears. These parts of the body also contain melanocytes.

To diagnose vitiligo, your doctor will look closely at your skin. They may use a special type of light that makes spots of vitiligo look chalky. You might also have a skin sample taken to look for pigment cells.

The condition isn't painful. But some people experience itching while the skin is losing color, explains Dr. John Harris, a skin expert at the University of Massachusetts.

Some people feel distressed at the loss of their skin's color. They may develop low self-esteem or a poor self-image from concerns about their appearance.

"Vitiligo can cause a reduction in quality of life, because it tends to involve parts of the body that can't be hidden," says Harris. But treatments are available. And special makeup can help hide the discoloring.

Some treatments aim to slow or stop the disease from getting worse. Others may restore the skin's color. But these can take time to work. And some areas of the body are easier to treat than others.

A type of light therapy called UVB phototherapy is commonly used to treat the disorder. It uses special lamps that encourage the pigment cells in your skin to regrow.

Light therapy works better on some parts of the body than others. For example, it rarely works well on the hands, Harris says, "but the face is the easiest to treat."

Some people may need medications that suppress the immune system. These can be given as skin creams or pills.

If someone stops treatment, vitiligo comes back, Harris explains. His team is looking for ways to make the immune system "forget" the melanocytes. That would prevent it from attacking them.

Drugs that suppress the immune system "are like cutting the power to the house to turn off the light in your bedroom," says Harris. "We want to create more targeted therapies."

In severe cases of vitiligo, surgery or bleaching larger areas of the skin to match the white patches may be options. Talk with your health care provider about what steps you can take to help with the condition. See the Wise Choices box for tips on living with vitiligo. ■



Wise Choices

Living With Vitiligo

- **Protect your skin from the sun.** Use sunscreen and wear protective clothes.
- **Avoid touching harsh chemicals** and other things that can irritate your skin.
- **Try cosmetics to cover white areas.** Talk with your health care provider about which products are safe to use.
- **See an expert.** Ask your doctor for a referral to a skin specialist who has experience treating people with vitiligo.
- **Join a support group.** Talking with other people with vitiligo can help you learn new ways to cope with the condition.

Definitions

Inflammation

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



Web Links

For more about vitiligo, see "Links" in the online article: newsinhealth.nih.gov/2021/03/patchy-skin



Health Capsules

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

How Long Does Protection Last After COVID-19?

After your body's disease defense system (the immune system) fights off a virus, it keeps a memory of it. A study suggests that people's immune systems remember COVID-19 for months after recovery.

The immune system makes different types of cells and molecules to fight disease. These include antibodies, T cells, and B cells.

Researchers looked at immune responses from about 200 people who'd recovered from COVID-19. Some had been infected up to eight months before the analysis. Other

cases were more recent. Of the people who recovered, 95% had immune system "memories" of the virus that causes COVID-19, SARS-CoV-2.

Almost everyone had antibodies that block the virus' spike protein. The virus uses this protein to enter cells. The number and type of antibodies varied between people. But the levels usually remained stable over time. They slightly decreased six to eight months after infection.

Immune cell levels also remained high. Memory B cells, which make antibodies, increased for a few

months after infection and then remained stable. Most people had one important type of T cell. About half had another type of T cell that kills infected cells.

"Several months ago, our studies showed that natural infection induced a strong response, and this study now shows that the responses last," says Dr. Daniela Weiskopf at the La Jolla Institute for Immunology. "We are hopeful that a similar pattern of responses lasting over time will also emerge for the vaccine-induced responses." ■

Preventing Kidney Disease

Your kidneys are two bean-shaped organs about the size of your fist. They sit below the rib cage on each side of the body. Kidneys filter blood. They remove waste products and water to make urine. They filter about a half cup of blood every minute.

The kidneys also make substances that control your blood pressure. And they play an important role in keeping your bones strong.

Chronic (long-term) kidney disease damages your kidneys so that they can't filter blood properly. The

damage happens slowly over a long period of time. It can lead to kidney failure. If your kidneys fail, you will need a kidney transplant or dialysis, a treatment that filters your blood artificially.

Kidney disease is common. Certain people are at higher risk. Diabetes is the leading cause. Almost 1 in 3 people with diabetes has chronic kidney disease. You're also at greater risk for kidney disease if you have high blood pressure or heart disease.

Early kidney disease may not have

symptoms. Getting tested can be the only way to detect it. Talk to your health care provider about kidney testing if you have risk factors, including a family history of kidney failure.

You can take steps to protect your kidneys. Make healthy food choices and cut back on salt and added sugars. Aim for a healthy weight and more physical activity. For more information on kidney disease, visit www.niddk.nih.gov/health-information/kidney-disease. ■



Featured Website

COVID-19 Spanish Resources Page

salud.nih.gov/covid-19

Looking for COVID-19 resources in Spanish? NIH has a COVID-19 Spanish resource page. Visit the site for information on testing,

treatments, and vaccines. You can also find information about participating in COVID-19 clinical trials.



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