How Long Can Germs Survive on Surfaces?

More specifically, how long do bacteria and viruses live on surfaces at home under normal interior temperatures? It’s complicated. Some microbes could survive on household surfaces like telephones, door handles, countertops, and stair railings for centuries if left undisturbed. But most don’t.

Humid homes are better hosts to most infectious microbes. Bacteria and viruses cannot live on surfaces with a humidity of less than 10 percent.

> *Bacteria called mesophiles, such as the tuberculosis-causing Mycobacterium tuberculosis, survive best at room temperature and are likely to thrive longer than cold-loving psychrophiles or heat-loving thermophiles. According to Tierno, at room temperature and normal humidity, Escherichia coli (E. coli), a bacteria found in ground beef that causes food poisoning, can live for a few hours to a day. The calicivirus, the culprit of the stomach flu, lives for days or weeks, while HIV dies nearly instantly upon exposure to sunlight. Other microbes form exoskeleton-like spores as a defense mechanism, like the bacteria Staphylococcus aureus, which is responsible for toxic shock syndrome, food poisoning, and wound infections. In this way, they can withstand temperature and humidity extremes. Tierno says this bacterial spore can survive for weeks on dry clothing using sloughed skin cells for food. The Bacillus anthracis, the anthrax bacteria, can also form spores and survive tens to hundreds of years.*
>
> *Popular Science*

Speaking of spores, some types of mold can grow on almost any surface in the home. Mold grows best when there is a lot of

moisture, but there is no way to rid your home of all molds. Even if you could, mold spores are practically indestructible, though lower humidity will help keep spores from growing into mold.

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Experts recommend home humidity be less than 60, but we recommend below 40 for a home that's already moldy and potentially causing or exacerbating illness.

> *Candida albicans as the most important nosocomial fungal pathogen can survive up to 4 months on surfaces. Persistence of other yeasts, such as Torulopsis glabrata, was described to be similar (5 months) or shorter (Candida parapsilosis, 14 days).*
>
> *NCBI*

How Long Does Coronavirus Survive on Surfaces?

Researchers are only beginning to understand how SARS-CoV-2 (the cause of COVID-19) survives on surfaces. Lab results don't guarantee similar real-world results, but recent research shows the virus's survival depends on what it lands on and the humidity in the room or on the surface. The live virus is said to be able to survive on various common surfaces from three hours to seven days.

- Glass – 5 days
- Wood – 4 days
- Plastic & stainless-steel – 3 days
- Cardboard – 24 hours
- Copper surfaces – 4 hours

> *Paper and cardboard are very porous. The virus doesn't like*

> *surfaces like that. It likes smooth, even things.*
>
> *Frank Esper, MD – Cleveland Clinic*

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> *Spreading the virus from products or packaging that are shipped over a period of days or weeks at ambient temperatures is likely to be low risk.*
>
> *The CDC*

There's no research yet showing if the virus can survive on cloth textiles (like clothing or rags).

How Long Do Other Viruses Last on Surfaces?

> *Most viruses from the respiratory tract, such as corona, coxsackie, influenza, SARS or rhino virus, can persist on surfaces for a few days. Viruses from the gastrointestinal tract, such as astrovirus, HAV, polio- or rota virus, persist for approximately 2 months. Blood-borne viruses, such as HBV or HIV, can persist for more than one week. Herpes viruses, such as CMV or HSV type 1 and 2, have been shown to persist from only a few hours up to 7 days.*
>
> *NCBI*

HIV is said to live outside of the body for only a few seconds, but under certain conditions may last for up to a week – though surface-contraction infection is very nearly impossible. **Hepatitis C** can survive on surfaces without a host for up to 3 weeks at room temperature on common household surfaces. **Hepatitis A** can survive on surfaces for months.

Norovirus can live on hard or soft surfaces for about two weeks. In still water, it can live for months and maybe even years. **Influenza** (flu) viruses can survive on the skin for many hours, and on hard surfaces they are able to infect another person for up to 48 hours.

Viruses that cause the common cold include some of the previously known coronaviruses, rhinoviruses, RSV, and parainfluenza. Each of these viruses has many iterations of the virus, so life-longevity on surfaces varies. **RSV** lasts for a few hours on hard surfaces and up to 30 minutes on the skin. **Parainfluenza** lives on surfaces for up to 10 hours. **Rhinoviruses** can survive for 3 hours on skin and hard surfaces. Other **coronaviruses** are known to last a few hours on most surfaces, which is likely similar to the current, novel coronavirus.

How Long Do Bacteria Last on Surfaces?

Just like there are many types of coronaviruses, flu viruses, rhinoviruses, etc. there are also many types of staph, E. coli, salmonella, etc. Generally, viruses are more likely to survive longer on solid surfaces than on fabrics. But some bacteria seem to prefer fabric.

> *Most gram-positive bacteria, such as Enterococcus spp. (including VRE), Staphylococcus aureus(including MRSA), or Streptococcus pyogenes, survive for months on dry surfaces. Many gram-negative species, such as Acinetobacter spp., Escherichia coli, Klebsiella spp., Pseudomonas aeruginosa, Serratia marcescens, or Shigella spp., can also survive for months. A few others, such as Bordetella pertussis, Haemophilus influenzae, Proteus vulgaris, or Vibrio cholerae, however, only persist for days. Mycobacteria, including Mycobacterium tuberculosis, and spore-forming bacteria, including Clostridium difficile, can*

also survive for months on surfaces.

NCBI

On that note, if you own a microwave, we don't recommend using it except to nuke your sponges. Saturate the sponge with water and heat on high for one to two minutes.

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Staph typically survives on surfaces for "24 hours or more," and studies have shown it can survive on some objects like towels and razors for weeks, and *Staphylococcus aureus* can survive for months on dry surfaces with very low humidity.

Most **salmonella** lives on dry hard surfaces for up to four hours depending on its species, but a 2003 study found that *Salmonella enteritidis* can survive for four days and still infect.

E.coli, often found in ground beef, can live for a few hours to a day on kitchen surfaces.

Listeria infections are responsible for the highest hospitalization rates (91%) amongst known food-borne pathogens. Listeria can last for months on many surfaces, can proliferate inside your refrigerator, and has a very slow incubation period lasting days, weeks, or even months, which can make it difficult to know that contamination has occurred.

Botulism is a disease caused by Clostridium botulinum, a bacterium that produces botulinum toxins under low-oxygen and low-acid conditions. Botulinum toxins are one of the most lethal substances known. Spores produced by the bacteria *Clostridium botulinum* are heat-resistant and exist widely in the environment. In the absence of oxygen, they germinate, grow, and then excrete toxins. Botulinum toxins are

ingested through improperly processed food in which the bacteria or the spores survive, then grow and produce the toxins. But the good news is that botulism is rare, botulinum spores will not proliferate, and the bacterium will not survive on household surfaces. Homemade canned and fermented foods are a common source of foodborne botulism.

Bacillus cereus is one of the most common causes of food poisoning, though fortunately, it is not typically life-threatening. Bacillus cereus readily forms biofilms on a variety of surfaces, including plastic, soil, glass wool, and stainless steel, thus can last indefinitely.

Germs Aren't Bad Guys

Microbes, of course, are everywhere. Each square centimeter of skin alone harbors about 100,000 bacteria. The human body contains trillions of microorganisms. Trillions upon trillions of viruses rain from the sky every day. A 2002 report in the *Southern Medical Journal* found pathogens, including staphylococcus, on 94% of paper money tested. Money is said to possibly carry more germs than a household toilet.

And yet, we don't get a staph infection 94% of the time we touch money. Why?

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Understanding Health – How To Have A Strong Immune System

A lot has to happen in order for us to contract an infection. For viruses, bacteria, amebas, fungi, parasites, and other pathogens, the environment needs to be conducive to proliferation, and the pathogen needs to be of sufficient quantity to infect. The likelihood of infection under the most

infection-likely conditions is also contingent upon the number of microbes that are able to make it into the body. Statistically, one microbe is very unlikely to cause infection and then disease, whereas thousands of the same pathogen contaminating a person is more likely to infect and eventually cause disease.

There is no healthy way to avoid pathogens. For instance, you're not going to catch Lyme disease from your kitchen counter. You might contract it from ticks and other insects, but getting out in nature is crucial for good health. Also, our antimicrobial lifestyles are leading to superbugs and more fungal-based auto-immune diseases (nearly all autoimmune disease is fungal based or exasperated by fungal infection).

To make things even more complicated, many of the bacteria in our bodies that are part of our healthy microbiome can become pathogenic under the right (or wrong) circumstances. E. coli is a perfect example. We all have this bacterium in our gut, but without a healthy gut colony, E. coli can take over and cause infections in the gut and urinary tract. Candida is another one that just about everyone has in their gut. The spores and small amounts of yeast do not cause infection and are a necessary part of our body's microbial, but without enough of a variety of bacteria to keep fungi in check, Candida becomes a pathogenic fungus that causes or exacerbates many illnesses.

Related: *How To Heal Your Gut*

Pathogens inflict damage to us by secreting toxic waste byproducts throughout their lifecycle and death that inhibit normal, healthy cellular functions. A healthy microbiome has thousands of different kinds of bacteria (and other microbes) that can absorb and use these waste byproducts. Basically, to put it in the least scientific terms possible, one bacteria's poop is another bacteria's food source. Also, a body full of healthy bacteria leaves little room for infection. The more

bacteria you have, both in variety and numbers, the less susceptible a host you are to pathogenic infection.

What doctors and most scientists still fail to understand is this: cells are made up of fats, starches, and sugars. Weak, decaying, and dead cells feed microorganisms. Pathogens, as they feed, produce toxic waste that causes more cellular damage, creating a feedback loop that feeds the infection. Beneficial microbes also feed off of our dead and decaying cells the same way, but their existence, due to their diversity, does not damage the surrounding human cells and does not allow room for pathogenic activity. To be clear, the difference between a bacterial infection and healthy bacteria doing their job is usually all about the variety.

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In order to be healthy, perhaps it is even more important to understand that our gut bacteria resides not just in our gut, but all over our bodies. Our microbiome is everywhere, on our skin and in our hearts, and in our brains. Our gut, when healthy, is a microbiome-producing machine that supplies our entire body with beneficial bacteria. Unhealthy guts deliver pathogens into the body (and undigested foods and other toxins) while a healthy gut provides healthy bacteria to the entire body, bacteria that defend against pathogenic activity.

Now picture yourself as not so healthy. Maybe you smoke. Maybe you drink soda. Maybe both. Your throat feels rough. Your sinuses feel overly-sensitive. You can imagine that these rough surfaces are more likely to “catch” a few pathogens. On your tonsils and in your sinus cavities, where a healthy person has lots of diverse, healthy microbes to keep pathogens from proliferating, an unhealthy body instead has weak, poorly functioning cells that are ready to feed an incoming infection.

This is why we recommend healing the gut first and foremost

for virtually any illness. Even a knee injury needs a healthy gut in order to properly heal as quickly and as well as possible. A nagging injury that never seems to heal almost always contains infectious activity. In other words, that nagging elbow pain you have may be from an old injury, from your back being out of alignment, from arthritis, or from something else, but infection will set in sooner or later as cellular degradation accelerates if your gut isn’t well enough to defend your whole body.