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How to Make (and Use) a Disinfectant Against Coronavirus

Here's a guide to working with sprays, wipes and a bleach-based solution to clean surfaces of the pathogen.

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The coronavirus that causes Covid-19 may survive for [several days](#) on some surfaces. Estimates of its life span vary, but the virus can clearly hang around long enough to make disinfecting frequently touched surfaces a priority.

Normally, disinfectants, like Lysol and Clorox wipes, are available and would do the trick in cleaning most surfaces of contagions, but many of these items have been widely out of stock across the United States. If you cannot find any of these products, you can make an [effective homemade disinfectant](#) from a mixture of water and bleach.

Whatever you use, it's crucial to know [how to use a disinfectant properly](#) — that means allowing enough time for a disinfectant to do its job, which can be as much as 10 minutes.

How to use common disinfecting products

When disinfecting a surface, by far the most important consideration is what's known as dwell time: the amount of time the disinfectant needs to remain on a surface to kill pathogens, and in this case, specifically the coronavirus that causes Covid-19. No disinfectant works instantly; most of those sold to the public take several minutes. Different dwell times don't indicate that one disinfectant is more or less effective than another. They're just how long products take to eliminate the coronavirus, the result you want. But dwell time is not the only thing you need to pay attention to.

Complete disinfecting protocol includes four steps: Pre-cleaning, disinfecting (dwell time), wiping clean and rinsing with water. "But we're lucky if we get two," meaning dwell time and wipe-up, said Mark Warner, education manager at the Cleaning Management Institute, a provider of training and certification for professional cleaning services. Pre-cleaning is most important on heavily soiled surfaces, because dirt can shield pathogens underneath; it's fine to use soap and water or a household cleaner. Disinfecting for the proper dwell time, of course, is nonnegotiable. Wiping afterward is essential because disinfectants can leave a sticky residue where pathogens can quickly resettle. And rinsing finishes the process.

Nonbleach Options: Nonbleach disinfectants are usually safe on fabric and other soft materials, though they are generally rated to "sanitize" rather than disinfect. For example, Clorox Disinfecting Wipes are rated to eliminate the virus in a relatively quick four minutes. Lysol Disinfecting Wipes

employ the same type of nonbleach disinfectant but take longer to work: 10 minutes. Don't let that be a concern: If you have them, use them.

[Lysol Disinfectant Spray](#) and [Lysol Disinfectant Max Cover Mist](#) also use the same type of nonbleach disinfectant, a class of compounds known as quaternary ammonium, or simply "quats." They're safe on hard surfaces and most fabrics, gentler on the skin than bleach and produce fewer harsh fumes. Both eliminate the coronavirus in 10 minutes on hard surfaces but only sanitize (kill most but not all pathogens) on soft surfaces.

[Lysol Kitchen Pro Antibacterial Cleaner](#) is fabric-safe, because it uses quats instead of bleach. It eliminates the coronavirus in two minutes on hard surfaces; on soft materials, it may only sanitize.

Bleach-based Disinfectants: Clorox Multi-Surface Cleaner + Bleach eliminates the coronavirus in one minute on hard surfaces such as you find in kitchens and bathrooms — sinks, faucets, toilets, tile and synthetic countertops. Any bleach-based spray like this is for use only on hard surfaces. It will damage fabrics, feel harsh on skin and produce fumes that can irritate mucous membranes. Take [precautions](#) like ventilating the room and wearing gloves. [Clorox Clean-Up Cleaner + Bleach](#) is similar, but takes five minutes to disinfect hard surfaces.

How to make your own

Assuming you cannot get any of the above products, you can disinfect hard surfaces of the coronavirus using a solution of regular household chlorine bleach and water. If you have bleach, you can make your own mixture and dispense it with a spray bottle or with paper towels. But please be careful and read instructions when dealing with bleach as with all chemical products.

Multiple sources give different bleach-to-water ratios for use with regular bleach. The [Centers for Disease Control and Prevention](#) says that "unexpired bleach will be effective against coronaviruses" in a 1:48 solution (1/3 cup of bleach per gallon of water, or 4 teaspoons per quart). [Clorox](#) recommends a slightly stronger 1:32 ratio (1/2 cup per gallon or 2 tablespoons per quart). Mark Warner recommends a much stronger 1:10 ratio (about 1 1/2 cups per gallon of water, or about 1/3 cup per quart). Some medical disinfectants are basically the same solution.

Whichever ratio you use, let it sit on the surface for 10 minutes: Warner told us that this is the Environmental Protection Agency's guideline for any new or unknown pathogen, and it is also the dwell time listed for the regular household bleaches on the [E.P.A.'s](#) List N, which means it is approved to eliminate the coronavirus when properly used.

Don't mix up more than you will use within a day or two. Bleach [degrades fairly rapidly](#) once taken from its original storage container, becoming less effective each day. Storing the container away from light can prolong its useful condition. If your bottle of bleach is expired, add a bit extra to the mixture, and try to find a fresh bottle when you can.

Be careful

Bleach mixtures can be used only on hard surfaces — they will permanently damage most fabrics and many other soft materials — and are unpleasant to work with. Wear gloves. Ventilate the space as well as possible. "Bleach is corrosive, even the vapors," Warner said. "Gives you a sore throat, you

don't taste dinner, and you wake up the next day with a weird taste in your mouth."

You also need to wipe it off after the 10-minute dwell time, because left to sit indefinitely, bleach can damage even resilient materials like stainless steel. And it can cause some plastic containers to break down over time. (I used to keep some in an industrial spray bottle, for bathroom use; the screw-top fell apart after about a year, though the bottle itself, made of a different type of plastic, was fine.)

But in this moment, those are secondary concerns. "As you know, disinfectants are high demand and low supply," Warner told me. "Apply a disinfectant and give it a 10-minute dwell time. Or mix some bleach up at 1-to-10. That gives you your best shot."

Before you begin preparing any bleach solutions, especially if you're new to this, please thoroughly read over the entire warning label on the bottle of bleach and exercise an abundance of caution in storage, handling and cleaning up afterward. Information on avoiding "irreversible eye damage and skin burns" is worth your time.

And never, ever mix bleach with ammonia or anything containing ammonia (like many window cleaners), or with anything acidic (like white vinegar and many lime scale/rust removers, including CLR and Bar Keepers Friend). Doing either [will produce highly dangerous and even deadly gases](#). Finally, Warner said, it's best to dispose of prepackaged wipes or paper towels that you've used to disinfect surfaces. Reusable cloths and mops "should be exchanged for a new one often during a cleaning process, then laundered." In medical facilities, he said, they are used for a maximum of three rooms before being washed. With a paper towel shortage, reusable cloths might be the way to go at home, too — let's just hope you can still find some [laundry detergent](#).