

Can Hand-Washing With Cold Water Really Kill Germs?

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STORY AT-A-GLANCE

- › If you've been taught that washing your hands in warm water is necessary to get rid of dirt, germs and bacteria, one study says using cold water works fine if you follow a few important methods
- › The U.S. Food and Drug Administration used to state that plumbing fixtures, especially in restaurants, should deliver water a minimum of 100 to 108 degrees Fahrenheit for people to get their hands clean
- › Researchers in 2017 said it's time to adjust U.S. guidelines to reflect the fact that cold water is just as effective if people wash their hands for 10 seconds, using soap and the proper hand-washing method
- › Some people, such as children, infants and the elderly, have a higher risk of picking up infections and spreading them, and at certain times, washing your hands is particularly crucial, such as after handling pets or raw meat

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If you've ever been in a place or circumstance where hot running water wasn't available for some reason, perhaps you had a vague sense when washing your hands in the only water available – cold – that they weren't really getting clean. That's probably because most of us learned in kindergarten that washing with hot, soapy water is imperative to kill germs. The belief is so ingrained that it's been written in government regulations (at least in the U.S.) for years.

Even using soap with cold water may seem as if using hot water would do a better job, but is there any actual scientific evidence this is true? Here's your answer: Research shows that if the water you're using to wash your hands is lukewarm or even cold, it does just as well as hot to remove bacteria. It's the length of time and the method that make all the difference.

The study, conducted at Rutgers University and published in the Journal of Food Protection,¹ involved 21 participants and ended with an interesting conclusion: Whether they washed their hands in 60-, 79- or 100-degree (Fahrenheit) water, there was no difference in the "clean" they attained when they lathered their hands and washed them for 10 seconds.

But here's the kicker: Every one of those individuals had high levels of E. coli bacteria "applied" to their hands. Although the scientists in charge used a "nonpathogenic" strain of the bacteria, each subject was asked to wash their hands using several different water temperatures and for varying lengths of washing time.

They used cold, warm or hot water, between half a milliliter and 2 milliliters (ml) of soap and washed for anywhere from five to 40 seconds. They repeated the experiment 20 times over a six-month period. Time added:

"When the researchers analyzed the amounts of bacteria left on hands after washing, they found that water at all three temperatures worked equally well. So did the different amounts of soap used, although they say more research is needed to determine what type of soap is best."²

Misinformation, Recommendations and Revisions

BBC News³ noted that while the U.S. cleanliness guidelines are more stringent, U.K. guidelines say people can use either hot or cold water for hand-washing. However, those researchers said they realized their study was small in scope and that more extensive work is needed to determine the best ways to remove harmful bacteria or "bugs."

The important thing, the BBC noted, is to make sure you **wash your hands** for a minimum of 20 seconds, use enough soap to cover every hand surface and rub your hands together several different ways to make sure every surface is clean.

Authors of the featured 2017 study said their research was important because the guidelines⁴ by the U.S. Food and Drug Administration (FDA)⁵ used to state that piped-in water and plumbing fixtures should deliver water set at a minimum of 100 to 108 degrees Fahrenheit for people to get their hands clean. Those guidelines were scheduled for review and revision in 2018, however, so the researchers said it was time for the language to be changed to reflect the reality. They wrote:

"The literature on hand washing includes a tremendous amount of misinformation, and data on many issues are missing. Many hand washing recommendations are being made without scientific backing, and agreement among these recommendations is limited, as indicated by the major inconsistencies among hand washing signs."⁶

The length of time people use for washing their hands matters, as actual testing proved that five seconds isn't long enough, while scrubbing for 10 seconds is just as effective for getting hands clean as washing for longer periods.

"The time you spend turning on the tap, putting soap in your hands, and rinsing afterward – those don't count," maintains co-author Donald Schaffner, distinguished professor and extension specialist in food science at Rutgers. His bottom line, according to Medical News Today:⁷

"This study may have significant implications towards water energy, since using cold water saves more energy than warm or hot water. There should be a policy change. Instead of having a temperature requirement, the policy should only say that comfortable or warm water needs to be delivered. We are wasting energy to heat water to a level that is not necessary."

How to Make Sure Your Hands Are Really Clean, Even Using Cold Water

Ten seconds is the minimum amount of time necessary to get the job done. But are there instances when **washing your hands longer** than that or using different methods is necessary? Absolutely, Schaffner says. "If you just changed a diaper or you've been in the garden or you're cutting up a raw chicken, don't think you're good to go after 10 seconds if you can still see or feel something on your hands. By all means, keep lathering."⁸

However, if warm water is available, something as simple as maintaining a comfortable water temperature may make all the difference in encouraging people to wash for an adequate length of time to get their hands clean. Otherwise, "you're not going to do a good job," he advises.

According to the experts, there's a right way and a wrong way to do almost everything, but when it comes to getting your hands clean, especially when you want to wash something particularly nasty off, there is a foolproof, step-by-step procedure, which begins with spending as much time scrubbing as it takes to sing the happy birthday song, twice. The procedure, provided by The World Health Organization,⁹ is as follows:

1. Wet your hands and apply enough soap to cover each surface.
2. Rub your palms together in a circular motion.
3. Rub each palm over the back of the other hand, scrubbing between your fingers.
4. Rub your palms together with your fingers interlaced.
5. Rub the backs of your fingers by placing one hand over the other, and around each thumb.
6. With your hands still soapy, rub both palms with your fingertips, then rinse thoroughly with either warm or cold water.

NHS Choices¹⁰ advises that you use an alcohol-based "handrub" if you don't have immediate access to soap and water. Afterward, **dry your hands thoroughly** with a

disposable towel, if possible. If you haven't already gotten into the habit, use the paper towel to turn off the faucet, and also to open the doors, should you be in a public restroom.

There's More to Consider Than Simple 'Germs'

Using lukewarm or even cold water for hand-washing for the proper amount of time could have several advantages, such as limiting the time water runs to get it warm, which would save both money and energy, especially in restaurants and other food establishments, Schaffner maintains. Similarly, using water that's too hot could be irritating and even damaging to the skin.

In fact, when people regularly apply a hand lotion or moisturizer, it helps to not only repair dry, damaged skin (which is more difficult to clean), but hands bear fewer bacteria after washing than people who don't use lotion (make sure it's a natural variety).

But **some germs are more serious** than others, and some people, such as children, infants and the elderly, have a higher risk of picking up infections and spreading them. NHS Choices lists instances when it's particularly important to wash your hands, and make sure kids wash, as well:

- After using the toilet
- After handling raw foods – not just chicken and other meats but also raw veggies
- Before eating or handling food, even if it's "ready to eat"
- After contact with animals, including pets
- After visiting someone in the hospital or another health care setting

Washing your hands properly removes dirt, bacteria and viruses that might be spread to other people and objects, which can spread such things as flu, food poisoning and **diarrhea**. Professor Jeremy Hawker, a consultant epidemiologist at Public Health England, explains:¹¹

"Hands are easily contaminated with faecal bacteria (poo) when going to the toilet and this can be easily spread on to other things you touch, including food. Unfortunately, not all people consistently wash their hands after going to the toilet or before handling food. Washing your hands with soap and water is sufficient to remove dirt, viruses or bacteria and it can reduce the risk of diarrhea by nearly 50%."

What About Antibacterial Soap?

Many homes, hospitals and classrooms use antibacterial soap as a matter of course, but is it really any better? Is it even safe? Here's what a lot of people, including those in the medical profession, don't understand about **antibacterial soap** – The first antibacterial soap was introduced by Dial in the 1940s.

What it contained, though, was the chemical hexachlorophene, an antibacterial agent confirmed to cause brain damage in infants. The company was ordered to withdraw it from the market.

Then a couple of enterprising individuals devised another chemical called **triclosan**, which some may remember claimed to "kill germs on contact." It may have, to some degree, but it killed other things along the way.

Multiple companies jumped onto a very lucrative bandwagon, and "antibacterial" soaps started showing up everywhere, as they claimed to "make your environment safer and provide an extra layer of protection against illness." But in late 2013, the FDA decided to take another look at triclosan, and in doing so noted two separate problems:

- Possible interference with hormone levels in laboratory animals
- An increase in the growth of drug-resistant bacteria

A few days later, they submitted another statement that no evidence could be found that "over-the-counter (OTC) antibacterial soap products are any more effective at preventing illness than washing with plain soap and water."

According to Chemical Watch Global Risk & Regulation News, the Natural Resources Defense Council (NRDC) filed a lawsuit against the FDA in 2010, claiming it "had violated the Administrative Procedure Act and the Federal Food, Drug and Cosmetics Act by 'unreasonably delaying the issue of monographs establishing conditions for the use of certain products containing triclosan as the active ingredient.'"¹²

Dangers of Triclosan, an Ingredient in Antibacterial Soap

Experts say antibacterial soaps containing triclosan aren't recommended for use on cuts and scrapes because it prolongs wound healing and increases your risk of scar formation. But worse, the European Union announced it would be phasing triclosan out of hygiene products because the risks outweighed the benefits. Although there are many more, risks include:

- Increased cancer risk
- Interference with muscle contraction and activity
- **Endocrine hormone disruption**
- Disrupted **thyroid function**
- Increased allergies to peanuts and hay fever

Many products have included triclosan in their **antibacterial products**, but Beyond Pesticides notes that, due to pressure from informed consumers, a number of some of the larger manufacturers have without a lot of fanfare begun reformulating at least some of their products without triclosan. Therefore:¹³

"Product formulations may change without notice ... Remember to always refer to product labels to determine whether triclosan is contained in your product. Some retail outlets may still carry older formulations. Look out for labels that state: 'antimicrobial protection.' Some antibacterial soaps may use triclosan's cousin, triclocarban, in place of triclosan."

The bottom line is that if you have nothing but cold water available, washing your hands using proper scrubbing methods for at least 10 seconds and using simple soap without the "antibacterial" label will get your hands clean.

Sources and References

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