

## Popular Article

### In this COVID-19 pandemic, is it safe to use hand sanitizer frequently ?

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#### **Abstract**

In the international health emergency brought on by COVID-19, several experts advise using hand sanitizers as a COVID-19 safety strategy. The popularity of hand sanitizers has skyrocketed. As a result of the heavy and abrupt misuse of hand sanitizers and cleaning supplies during the pandemic may contribute to an increase in the antimicrobial resistance. It will put more on our already stressed-out healthcare systems, possibly resulting in more fatalities. Skin that is sensitive to ethanol may become toxic to the body and respond when exposed. Exposure to ethanol on a frequent basis might result in contact dermatitis, cracking, itching, skin dryness and redness.

#### **Introduction**

Since the spread of the COVID- 19 pandemic, hand sanitizers have been the most sought-after personal care items, which previously not in widely use. However, the growing demand for hand sanitizers may provide an advantage to produce and supply possibly fake or low-quality goods in the markets. If you have any doubt, do not buy those items. Few guidelines have been published by the WHO regarding the standard formula of hand sanitizers and how to use them properly. Generally, an alcohol-based hand sanitizer contains a mixture of isopropyl alcohol, ethanol (ethyl alcohol), or n-propanol, with the most powerful formulations containing 60 to 95 % alcohol. Hand sanitizer based on alcohol acts against a large variety of microorganisms but not spores. Usually, non-alcoholic versions contain benzalkonium chloride or triclosan, but are less successful than alcohol-based variants (Prajapati et al., 2022).

#### **Merit and demerit of use of hand sanitizers**

The clean hand campaign of the US Centres for Disease Control and Prevention (CDC)'s instructs the public to wash their hands. Hand sanitizer based on alcohol is only recommended if there is no soap and water available. Directions for using an alcohol-based hand sanitizers are as follow:

1. Apply the product to the palm of one hand.
2. Rub hands together.
3. Until the hands are completely dry, rub the product all over the surfaces of your hands and fingers.
4. When using hand sanitizer, stay away from flames and anything else that is burning. (CDC, 2021).

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Hand sanitizers dependent on alcohol cannot be successful when the hands are greasy or soiled. The hands of health-care staff are frequently polluted with the contaminants in hospitals, but seldom soiled or greasy. On the other hand, grease and soiling are normal in community settings from the following activities such as handling food, playing sports, gardening, and outdoor works. Similarly, hand sanitizers can network on pollutants like heavy metals and pesticides (Trampuz et al., 2004). Rubbing with alcohol kills many different types of bacteria. They also kill the other forms of viruses including the flu virus, common cold virus, coronavirus, and HIV, however, handwashing with soap and water is preferred over hand sanitizer in a sense to remove the spores of *Clostridioides difficile* bacterium and parasites such as *Cryptosporidium* (Gold et al., 2018 & CDC, 2020). Anyone can experience dryness and potentially cracked skin after frequent hand washings. The alcohol content in hand sanitizer can also cause skin burning, particularly compromised skin. It can be reduced by adding glycerol into hand sanitizers. It is not recommended to use hot water, since it can further inflame the skin and disrupt the skin barrier. Inversely, it is advised to use a hand moisturizer every time after washing the hand to maintain better infection control and barrier protection.

For many years, alcohol-based hand sanitizers and cleaning fluids have been used on the front line to kill antibiotic-resistant bacteria before they can get close to infect vulnerable patients but the bacteria are fighting back now. New strains have achieved the tolerance level against alcohol in the sanitizers. As per the WHO, our fixation with germ-killing has resulted in antibiotic-resistant bacteria in every corner of the globe (WHO, 2019).

### **What is antimicrobial resistance?**

Antimicrobial resistance occurs as bacteria, viruses, fungi, and parasites change in ways that make antibiotics unsuccessful in treating the infections they cause. When the microorganisms withstand most antimicrobials, they are called "superbugs." This is a major concern because a resistant infection may kill or spread to others and imposes huge costs to the individuals and society (WHO, 2017).

Antimicrobial resistance is the wider term for resistance in various microorganism groups, which includes resistance to antibacterial, antiviral, antiparasitic, and antifungal drugs. Resistance to antimicrobials occurs naturally but mostly it is encouraged by the imbalanced use of medicines such as antibiotics for respiratory infections such as coronavirus or flu or sharing antibiotics. Low-quality medications, incorrect prescriptions, poor prevention, and heavy use of hand sanitizer can lead to antimicrobial resistance (WHO, 2017). Inadequate monitoring, a growing arsenal of tools for

diagnosing, managing, and preventing antimicrobial drug resistance, as well as a lack of public engagement to address these issues, both contribute to a lack of regulation (WHO, 2021).

### **Can bacteria become alcohol-resistant?**

Yes, particularly enterococcal infections caused by bacteria affecting the digestive tract, bladder, heart, and other parts of the body have begun to increase. This is not only happening in India but also in the other parts of the world. The research shows that the several strains of enterococcal bacteria have begun adjusting to alcohol-based hand sanitizers. They are not resistant to alcohol but they are becoming tolerant to it (Higuita and Huycke, 2014). Now the condition will become worst as many of these alcohol-tolerant bacteria are resistant to multiple drugs as well. The researchers studied that the half of the strains cannot be treated with  $\beta$ -lactams as a last-line antibiotic. It means that the bacteria spread rapidly inside hospitals, and there are not many treatment options available. People are washing their hands less with soap these days because alcohol-based hand sanitizers help them feel safe. Nevertheless, you can become a vehicle for alcohol-resistant microbes (CDC, 2021).

Additionally, a genetic analysis of the alcohol-resistant bacteria found that they had acquired mutations in specific cell metabolism-related genes. Resistance to alcohol, however, appeared to have a different genetic basis than the resistance of the bacteria to antibiotics in general. Vancomycin-resistant enterococci (VRE), a community of bacteria are especially harmful to patients who have undergone a course of antibiotics because it has disturbed their bacterial composition in the gut. In other words, the sickest patients in the hospital are at the highest risk. However, these hand rubs should always be used in combination with other treatments and should always be used correctly. People's lack of willingness to clean their hands for a full 20-30 seconds may be one of the reasons why this bacterium has had a chance to mutate and become resistant (O'Driscoll and Crank, 2015).

As the use and abuse of antimicrobials have become more common, the number of resistant strains is growing. Infections that were earlier quickly handled are now life-threatening. We typically (and correctly) equate antimicrobial resistance with drug abuse, such as antibiotics. Misuse can involve failing to complete the course of antibiotics or avoiding daily dose intervals. Both will increase the risk of the most resistant strains of bacteria, but bacteria can also become immune to inappropriate or unnecessary use of other chemicals, including cleaning agents. Dilution or sporadic and inefficient use of sanitizing agents may provide a survival advantage for the most resistant strains, which may convert them ultimately into superbugs. Since antimicrobial resistance is already causing more than 8 lakhs deaths worldwide a year, we must act cautiously to prevent further effects.

Alcohol does not differentiate between healthy microbes and poor ones. The role as a killer of all-microbes has become a critical component of public health. We learn that, in addition to the

harmful microbes that can destroy us, our bodies contain beneficial bacteria that aid in digestion, help us prevent autoimmune diseases, and boost our immune system. Unfortunately, antibacterial also do not discriminate between good and bad microorganisms. The benefits of using a hand sanitizer is to avoid COVID-19 far along with the other microbes, such as bacteria, virus, and fungi that live on our bodies on a daily basis. While sanitizers destroy potentially harmful microbes, they change the populations of beneficial bacteria on the skin as well. Remember, what has just hit your palms? If you have spent a time in a hospital, a doctor's clinic, or at the bus stand or railway station next to someone coughing and sneezing, it's not a bad idea to use hand sanitizer. But if you're just going on your normal day without touching too many other people, you probably don't need to be sanitized. Remember we don't have to use hand sanitizer more and more, instead of that, we can use regular soap and water (WHO, 2020).

## Conclusion

After the start of the coronavirus pandemic, scientists and governments have been educating people on safe hygiene practices to protect themselves. This recommendation has drastically increased the selling and use of cleaning products and hand sanitizers. Unfortunately, these guidelines rarely include the instructions on their usage and side effects. There is a concern that the sudden overuse of cleaning products and hand sanitizers during the pandemic may lead to a rise in the numbers of antimicrobial-resistant species of the bacteria. It will pressurized our already troubled healthcare systems, potentially leading to more deaths. Moreover, the problem could continue long after the end of the current pandemic

*Anywhere we repeat a procedure over and over and over again, whether it's in a hospital or at home or anywhere else, you're giving bacteria an opportunity to adapt Tim Stinear*

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