

In the healthcare setting, “Alcohol” refers to two water-soluble chemical compounds—ethyl alcohol and isopropyl alcohol—that have generally underrated germicidal characteristics. These alcohols are rapidly bactericidal rather than bacteriostatic against vegetative forms of bacteria; they also are tuberculocidal, fungicidal, and viricidal but do not destroy bacterial spores.

<https://www.cdc.gov/infectioncontrol/guidelines/disinfection/disinfection-methods/chemical.html>

What concentration of alcohol should be used?

A 60% - 80% concentration of ethanol or isopropyl alcohol has been demonstrated to be the most effective. Water acts as a catalyst and plays a key role in denaturing the proteins of vegetative cell membranes. The water content slows evaporation, therefore increasing surface contact time and enhancing effectiveness. At concentrations higher than 80-85% the effectiveness as a disinfectant decreases.

Is it effective to use ethanol or isopropyl alcohol as a disinfectant?

-Ethyl alcohol (ethanol), at concentrations of 60%–80%, is a potent viricidal agent inactivating all of the enveloped viruses (e.g., herpes, vaccinia, and influenza virus) and many nonenveloped viruses (e.g., adenovirus, enterovirus, rhinovirus, and rotaviruses but not hepatitis A virus (HAV) or poliovirus). It has also been demonstrated to be effective against human immunodeficiency virus (HIV), rotavirus, echovirus, and astrovirus.

-Isopropyl alcohol, based on some studies, at concentrations of 60%-80% is not as active against the nonenveloped enteroviruses but is fully active against the enveloped viruses. Studies also have demonstrated the ability of both ethyl and isopropyl alcohol to inactivate the hepatitis B virus (HBV) and the herpes virus. Sars-CoV2 is an enveloped virus.

What is an Enveloped virus?

A virus encased within a lipid bilayer is called an enveloped virus.

What is a Nonenveloped virus?

A virus lacking a lipid bilayer is called a non-enveloped virus.

What amount of contact time should be used?

The concentration of ethanol or isopropyl alcohol determines the amount of contact time needed; the higher the concentration (60%) the longer the contact time required for disinfection. Recommending at least 2-10 minutes of contact time for 60% concentration and 5-15 minutes if using greater concentrations of alcohol are used (not to exceed 80%).

What is the difference between ethanol and isopropyl alcohol?

Ethanol and isopropyl alcohol are similar small molecules but differ in the location of the alcohol group on their chemical structures. Both alcohols are flammable, and both are used as disinfectants. There are varying grades of both in terms of purity, ethanol is more widely used in wet laboratories whereas isopropyl alcohol is preferentially used to disinfect electronic devices.



Is the use of alcohol approved by regulatory agencies?

- EPA List N only includes EPA-registered surface disinfectants. Hand sanitizers, antiseptic washes and antibacterial soaps are regulated by the Food and Drug Administration (FDA).
- FDA has not cleared any liquid chemical sterilant or high-level disinfectant with alcohol as the main active ingredient.

Resources

- [Chemical Disinfectants](#)
- [EPA List N](#)
- [FDA issues final rule on safety and effectiveness of consumer hand sanitizers](#)
- [Antiviral activity of alcohol for surface disinfection](#)
- [Comparative efficacy of ethanol and isopropanol against feline calicivirus, a norovirus surrogate:](#)

