

Welcome to COVID-19: Preparing Yourself and Your Family. This module will discuss washing your hands and the ins and outs of hand sanitizer as opposed to soap and water. We will discuss which one works better and why my family does not utilize hand sanitizer. My name is Sam Lushtak, owner of Absolute EHS.

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Hand sanitizer has been flying off the store shelves for a few weeks now. The world saw capitalism responding to supply and demand, resulting in a \$400 bottle of hand sanitizer online when it's normally only \$5 in the store. Many articles have been written about people who recognized the need for sanitizers early on and who drove from state to state buying as much as possible only to be told by online marketplaces that they would not be allowed to list their inventory. Those who collect mini hand sanitizers from boutique soap shops have been referred to as brilliant and well prepared.

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Hand sanitizer must have an alcohol content of 60% or greater to be effective. It also contains antibacterial components. The alcohol and antibacterials break through the germ cell's membrane and breaks the proteins inside. These proteins are what make the bacteria and viruses do what they need to do – infect people.

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The problem with hand sanitizer is multi-faceted. Firstly, hand sanitizers are not 100% effective and tend to leave at least 0.01% un-altered germs and viruses behind, as illustrated by the comic shown. It is no trivial matter that hand sanitizer has been proven not to work on norovirus, certain parasites, pesticides, or heavy metals either. Additionally, since there is no running water required, the intact as well as broken germs stay behind on your hands. On top of that, hand sanitizer will not work if your hands are already visibly dirty. Most importantly, if you do use hand sanitizer, it must be used correctly!

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This means a dime amount is put in the palm of your hand, it is then spread around both hands as if you were washing your hands per the CDC guidelines. You continue doing these washing motions until your hands are dry. If you wipe off the excess hand sanitizer or shake your hands to dry them more quickly, you are not using it correctly.

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Soap and water works a little differently. Soap has two ends on its molecules, one which sticks to oil – we call this 'non-polar' or 'hydrophobic' – and one that sticks to water – we call this 'polar' or 'hydrophilic'. Germs and viruses, when we touch them, stick to the natural oils on our hands. The soap also acts like a crowbar and destroys viruses and germs. These fragments of viruses and germs continue to stick to the oils in our hands. Just running water will not be effective – soap is necessary.

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As we can see in this picture, the squiggly tails are non-polar, or the hydrophobic – oil sticking – ends of the soap. The yellow circles are the polar, or hydrophilic – water sticking – ends of the soap. When we follow the CDC handwashing diagram to wash our hands, we naturally create enough friction to help the

soap get all the way around the dirt, germs, and viruses. We can see that we are creating enough friction by seeing how much the soap is lathering. After at least 20 seconds and a good lather, we can rinse our hands off under clean, running water. The soap, having completely surrounded the germs, will now be whisked away by the water, leaving us with clean hands.

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So which is better? Soap and water of course! Not only does soap and water actually destroy the bacteria and viruses, it actually helps get them off your hands entirely. That said, hand sanitizer is a good thing to use in a pinch where you have no access to clean running water and soap. Even if you do use hand sanitizer, always use soap and water as soon as possible afterwards.

Personally, during the coronavirus outbreak, I did not look for hand sanitizer in the store. I believe it becomes too easy to rely on it and it creates a false sense of security. Instead, my family washes their hands whenever we come inside or touch something that may have been touched by another person. By only using soap and water there is no question regarding whether we may be carrying viruses or not after we clean up. I should also point out that my family is self-isolating therefore we have no need to wash our hands when we are out of the house as we are not going into stores or crowded areas.

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Thank you so much for listening to this module on soap and water v. hand sanitizer. Feel free to email me if you have any questions, personal or about this presentation, at Samantha.lushtak@absoluteehs.com. Feel free to also check out my website for a full length, 45 minute, webinar that was previously recorded with a lot more information in it or check out one of my other short modules on the topic.

Finally, please consider supporting my small business at this time, particularly if you found this information or the worksheets and documents on the website helpful. Donations can be made via PayPal or through Venmo to Samantha-Lushtak.

Stay safe out there and wash your hands!