

Hand Hygiene in Preventing COVID-19 Transmission

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PRACTICE POINTS

- Alcohol-based sanitizers are as or even more effective as handwashing with soap and water for preventing disease transmission of enveloped viruses such as severe acute respiratory syndrome coronavirus.
- Although perceived as more irritating, alcohol-based sanitizers are less likely to cause irritant contact dermatitis of the hands than handwashing with soap and water.
- Use of humectants, moisturizers, and/or emollients in combination with alcohol-based sanitizers allows for effective hand hygiene without irritating the skin.

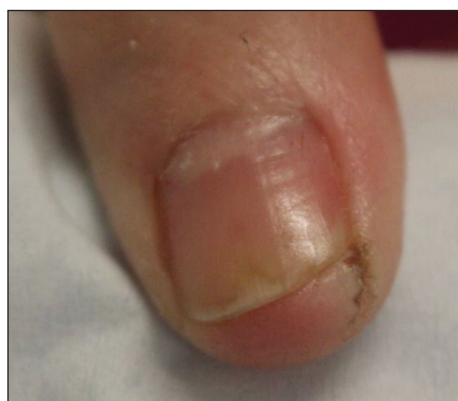
Handwashing with antimicrobial soaps or alcohol-based sanitizers is an effective measure in preventing microbial disease transmission. In the context of coronavirus disease 2019 (COVID-19) prevention, the World Health Organization and Centers for Disease Control and Prevention have recommended handwashing with soap and water after coughing/sneezing, visiting a public place, touching surfaces outside the home, and taking care of a sick person(s), as well as before and after eating. When soap and water are not available, alcohol-based sanitizers may be used.^{1,2}

Irritant contact dermatitis (ICD) is most commonly associated with wet work and is frequently seen in health care workers in relation to hand hygiene, with survey-based studies reporting 25% to 55% of nurses affected.³⁻⁵ In a prospective study (N=102), health care workers who washed their hands more than 10 times per day were 55% more likely to develop hand dermatitis.⁶ Frequent ICD of the hands has been reported in Chinese health care workers in association with COVID-19.⁷ Handwashing and/or glove wearing may be newly prioritized by workers who handle frequently touched goods and surfaces, such as flight

attendants (Figure). Patients with obsessive-compulsive disorder may be another vulnerable population.⁸

Alcohol-based sanitizers and detergents or antimicrobials in soaps may cause ICD of the hands by denaturation of stratum corneum proteins, depletion of intercellular lipids, and decreased corneocyte cohesion. These agents alter the skin flora, with increased colonization by staphylococci and gram-negative bacilli.⁹ Clinical findings include xerosis, scaling, fissuring, and bleeding. Physicians may evaluate severity of ICD of the hands using the hand eczema severity index, with scores ranging from 0 to 360 based on involvement in 5 different hand zones.¹⁰

Cleansing the hands with alcohol-based sanitizers has consistently shown equivalent or greater efficacy than antimicrobial soaps for eradication of most microbes, with exception of bacterial spores and protozoan oocysts.¹¹ In an in vivo experiment, 70% ethanol solution was more effective in eradicating rotavirus from the fingerpads of adults than 10% povidone-iodine solution, nonmedicated soaps, and soaps containing chloroxyleneol 4.8% or



A 62-year-old flight attendant with irritant contact hand dermatitis who reported frequent use of hand wipes due to fear of contracting coronavirus disease 2019. A skin fissure was noted on the right thumb.

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chlorhexidine gluconate 4%.¹² Coronavirus disease 2019 is a lipophilic enveloped virus. The lipid-dissolving effects of alcohol-based sanitizers is especially effective against these kinds of viruses. An in vitro experiment showed that alcohol solutions are effective against enveloped viruses including severe acute respiratory syndrome coronavirus, Ebola virus, and Zika virus.¹³ There are limited data for the virucidal efficacy of non-alcohol-based sanitizers containing quaternary ammonium compounds (most commonly benzalkonium chloride) and therefore they are not recommended for protection against COVID-19. Handwashing is preferred over alcohol-based solutions when hands are visibly dirty.

Alcohol-based sanitizers typically are less likely to cause ICD than handwashing with detergent-based or antimicrobial soaps. Antimicrobial ingredients in soaps such as chlorhexidine, chloroxylenol, and triclosan are frequent culprits.¹¹ Detergents in soap such as sodium laureth sulfate cause more skin irritation and transepidermal water loss than alcohol¹⁴; however, among health care workers, alcohol-based sanitizers often are perceived as more damaging to the skin.¹⁵ During the 2014 Ebola outbreak, use of alcohol-based sanitizers vs handwashing resulted in lower hand eczema severity index scores (n=108).¹⁶

Propensity for ICD is a limiting factor in hand hygiene adherence.¹⁷ In a double-blind randomized trial (N=54), scheduled use of an oil-containing lotion was shown to increase compliance with hand hygiene protocols in health care workers by preventing cracks, scaling, and pain.¹⁸ Using sanitizers containing humectants (eg, aloe vera gel) or moisturizers with petrolatum, liquid paraffin, glycerin, or mineral oil have all been shown to decrease the incidence of ICD in frequent handwashers.^{19,20} Thorough hand drying also is important in preventing dermatitis. Drying with disposable paper towels is preferred over automated air dryers to prevent aerosolization of microbes.²¹ Because latex has been implicated in development of ICD, use of latex-free gloves is recommended.²²

Alcohol-based sanitizer is not only an effective virucidal agent but also is less likely to cause ICD, therefore promoting hand hygiene adherence. Handwashing with soap still is necessary when hands are visibly dirty but should be performed less frequently if feasible. Hand hygiene and emollient usage education is important for physicians and patients alike, particularly during the COVID-19 crisis.

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