




# The Hands Have It

A guide to hand hygiene

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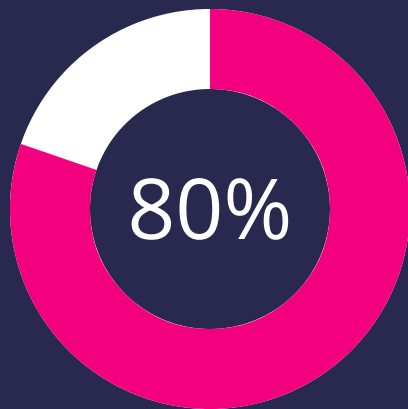
by

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# OUR HANDS


allow us to touch, feel, grasp, hold, caress, work, and express ourselves. Each hand is made up of the wrist, palm, and fingers and consists of 27 bones, 27 joints, 34 muscles, over 100 ligaments, and tendons and many blood vessels and nerves. Eighty percent of common infections are spread by the hands. And they can harbor pathogenic microorganisms such as MRSA and E-Coli.

This makes hand hygiene important for everyone but especially for those who work in high-risk settings such as Health Care Workers (HCW) and Food Handlers. So, when it comes to protection against the spread of disease, it is easy to say, "the hands have it".



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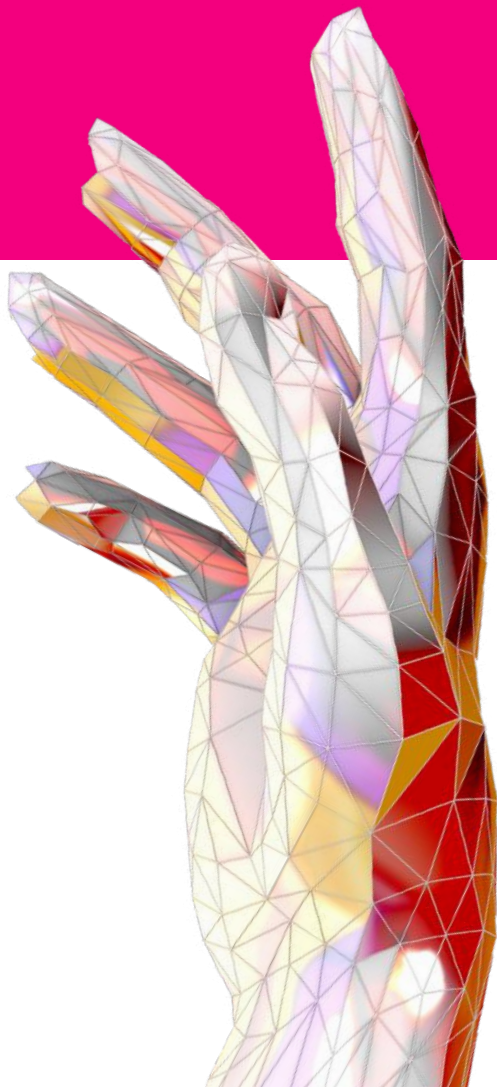




**Our hands contain and develop a specific microbiome of their own that is influenced by age, gender, product use, housemates and pet-ownership.**

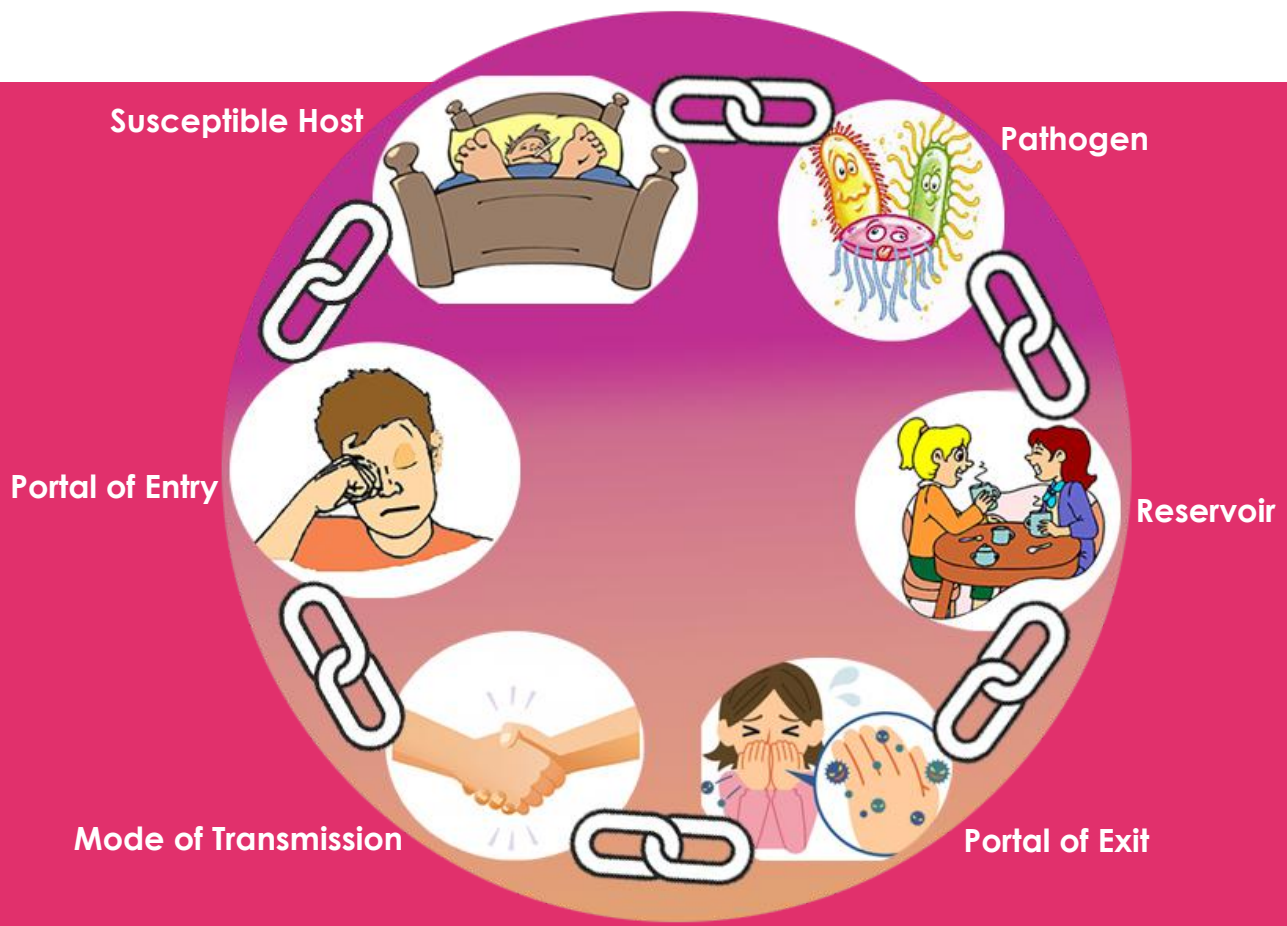


Even our day-to-day activities and the geographical area where we live affect the hand microbiome. In 1938 Philip Price established that the microbial population of the hands can be divided into two categories: resident flora and transient flora.



The resident flora is associated with the deeper layers of the skin and is not accessible to hand hygiene techniques. The transient flora colonizes the superficial layers of the skin and is removable with hand hygiene techniques. Transient flora includes microorganisms that are often associated with infections and viruses that can spread disease. They are transferred by direct hand contact which is a channel for exchanging microorganisms between the environment and the body. The ease of transfer of transient microorganisms allows the chain of infection to prosper.

The chain of infection consists of six requirements for disease transmission: pathogen; reservoir; a portal of exit; mode of transmission; a portal of entry; and a susceptible host. If one of these elements is eliminated, then the transmission of disease is stopped.



# Chain of Transmission

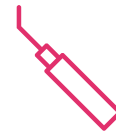
It has been documented that HCW can contaminate their hands or gloves with a variety of different pathogenic microorganisms even while performing “clean procedures” such as simply touching a patient’s intact skin. Some of the pathogenic microorganisms include drug-resistant strains such as Gram-negative bacilli, *S. aureus*, and *C. difficile*. In a 2004 study, Barker and colleagues showed that fingers contaminated with norovirus could sequentially transfer that same virus to seven different clean surfaces. Because of this, and the fact that human hands harbor up to 10<sup>6</sup> CFU/cm of microorganisms, performing proper and frequent hand hygiene is the best method to prevent the transmission of disease from person to person.

The Centers for Disease Control and Prevention (CDC) recommendations reflect the important role that proper hand hygiene provides in preventing the transmission of pathogens in healthcare settings. Hand-hygiene is a general term that applies to routine handwashing with plain soap or antimicrobial soap and water, the use of alcohol-based hand sanitizers and strengthened surgical aseptic handwashing. Either soap and water or alcohol-based hand sanitizers can be used for routine hand hygiene if there is no visible contamination on the hands.

The CDC's Hand Hygiene Guidance for Dental Health Care Providers (DHCP) is to use alcohol-based hand sanitizer or wash hands with soap and water for the following clinical indications:



**Before and after treating each patient (before and after placing treatment gloves)**



**After touching instruments, equipment, materials, and other objects that are likely to be contaminated by blood, saliva, or respiratory secretions with bare hands**



**Before leaving the dental treatment area**



**When hands are visibly soiled (including layers of hand sanitizers from frequent use)**



**Before reapplying gloves and after removing gloves that are torn, cut, or punctured**

# Routine Care Hand Hygiene for DHCP:

Hand washing for DHCP varies based on if the treatment being provided is routine or a more invasive surgical procedure.

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Wet hands first with water (do not use hot water)



Apply soap to hands.



Rub hands vigorously for at least 15 seconds, covering all surfaces of hands and fingers.



Rinse hands with water and dry thoroughly with a paper towel



Use a paper towel to turn off the water faucet

# Surgical hand hygiene/antiseptis for DHCP:



Use either an antimicrobial soap or alcohol-based surgical hand-scrub product with continuous activity



Antimicrobial soap: scrub hands and forearms for length of time recommended by manufacturer



Alcohol-based surgical hand-scrub product: follow manufacturer's recommendations. Before applying, wash hands and forearms with a non-antimicrobial soap



The antimicrobial activity of alcohols is attributed to their ability to denature proteins and hand sanitizers containing an alcohol concentration between 60-95% are more effective at killing germs.

Higher concentrations are less effective because water is needed for the denaturation of proteins. Alcohol-based hand sanitizers do not contribute to antibiotic resistance. In fact, they kill antibiotic-resistant germs by destroying the proteins and protective outer membrane that the germs need to survive.

When handwashing facilities are not readily available, such as on a mobile dental clinic, where school-based screenings are performed, or when there is a water boil advisory, alcohol-based hand sanitizers are a great alternative to soap and water.

A few other benefits of hand sanitizers are that they have been shown to be more effective at killing potentially dangerous microorganisms, are easier to use and can be gentler on hands by reducing dryness and irritation when compared to soap and water.



While alcohol-based hand sanitizers can inactivate many types of microbes, they must be used correctly to be effective. DCHP who use alcohol-based hand sanitizers as part of their hand hygiene routine can inform patients that they are following CDC guidelines.



Before donning treatment gloves, hands should be completely dry. It is universally accepted that the transmission of microorganisms is more effective in wet environments than in dry environments. Moisture left on hands can contribute to skin irritation and the regrowth of the transient flora.

Hand hygiene must be performed every time gloves are removed because gloves are not completely free of leaks or 100% tear-proof, and hands may become contaminated when gloves are removed.

Jewelry such as rings and bracelets increase microbial counts on hands and increase the risk of tearing or piercing protective gloves. Wearing jewelry should be avoided, or minimized, during patient care. A study investigating 20 volunteer dentists and 20 non-clinical volunteers found that skin underneath wristwatches and rings were more heavily colonized with microorganisms than control sites.

While the microorganisms were unlikely to cause infection in a routine dental setting, they were well-recognized nosocomial pathogens. In addition, most infection control guidelines recommend that fingernails are kept short to facilitate cleaning. Longer nails have increased numbers of microorganisms.

Subungual areas (under the fingernails) can harbor higher concentrations of microorganisms. HCW wearing artificial nails have up to 83% more pathogens on their hands, even after performing hand hygiene than those who do not wear artificial nails. Nails should be a maximum of 1/4-inch long and should not extend past the end of the finger.

Proper hand hygiene, whether it is done with soap and water or alcohol-based hand sanitizers, leads to a reduction in the number of viable pathogens that transiently contaminate the hands, which leads to a break in the chain of infection and stops the spread of disease.





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