



Hand hygiene and skin damage:
Eliminating the concept that
alcohol-based handrubs are more
damaging than handwashing.

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Foreword

Hand hygiene is one of the most important measures to prevent the spread and acquisition of healthcare-associated infections (HAIs).⁵ Hand hygiene is a critical component to infection control programs and considered a standard of care by both the Centers for Disease Control and Prevention (CDC) and the World Health Organization.^{5,18} The first written hand hygiene guideline for healthcare workers in the United States was published by the CDC in 1975. This guideline recommended handwashing with bland soap (non-antimicrobial) for the majority of patient contacts, antimicrobial soap before and after invasive procedures, and antiseptic handrubs (i.e., alcohol-based handrubs [ABHRs]) where sinks were not available.⁵ Scientific data demonstrating the advantages of ABHRs published throughout the 1980s and 1990s prompted the CDC to update the hand hygiene guidelines for healthcare settings. The updated guideline, published in 2002 and still current today, recommends ABHRs for routine decontamination when hands are not soiled and handwashing when hands are visibly dirty or contaminated. Despite the introduction of ABHRs as the primary means of hand hygiene in healthcare settings, concerns remain among many healthcare workers that use of ABHRs leads to drying of the skin and skin damage. This article will dispel this concept by summarizing the scientific studies that have demonstrated the effects of hand hygiene regimens on skin conditioning.



Advantages of ABHRs:

ABHRs, also known as hand sanitizers, antiseptic handrubs, and healthcare personnel handrubs have various advantages over handwashing.

Studies have clearly demonstrated that ABHRs are significantly more efficacious than handwashing.^{1,2,9-11} In addition, ABHRs offer the potential for increased compliance because their use does not require sinks.

This feature enables placement of alcohol-based products in convenient locations throughout hospital wards and patient rooms, shortening the time to perform hand hygiene. One published study recorded a mean time of 61.7 seconds for healthcare workers to walk from the patient to the sink, to perform a handwash, and then return to the patient.¹⁶ The authors determined that switching from handwashing to a 20-second ABHR could reduce the time a healthcare worker spends on hand hygiene by 25 to 40 minutes per eight-hour shift.

Other studies have estimated that healthcare workers encounter between approximately seven and 60 hand hygiene opportunities per hour so it does not come as a surprise when 69% of healthcare workers surveyed in a study experienced skin irritation lasting more than three weeks or experienced skin irritation more than once a year.^{12-14,16} Despite the numerous studies indicating the damaging nature of handwashing and education regarding the benefits of ABHRs, healthcare workers remain concerned about the effects of ABHRs on skin condition and health. A study with over 1,800 nurses found that 69.5% of nurses believed ABHRs to be more damaging than handwashing compared to 30.5% who believed handwashing to be more damaging than ABHRs.¹⁴

Effects of Handwashing on Skin Condition:

Handwashes are mixtures of detergents, surfactants and antiseptic agents and require elements of friction, lathering, water rinsing, towel drying, all of which can have considerable effects on the skin's epidermal barrier.¹⁵ Handwashing has been associated with considerable skin irritation and dryness. In one survey, approximately 25% of over 400 nurses reported currently having damaged skin while over 85% reported having problems with their skin at some point.⁶ In another

study, Larson et al. assessed skin damage after handwashing 24 times per day over a five-day period using a variety of end points.⁷ The study reported significant skin damage occurring within the five-day period including damage to the outer membrane of skin, the stratum corneum, and changes in self-assessed skin condition.

Comparison of ABHRs and Handwashing on Skin Condition:

While the previously mentioned studies focused on the effects of handwashing on skin condition, a multitude of studies have compared the effects of handwashing to using ABHRs. The most noteworthy study, published by Boyce et al., was a prospective randomized trial that compared the frequency of skin damage associated with two hand-hygiene regimens: handwashing and ABHRs.⁴ The study subjectively and objectively evaluated skin irritation and dryness, used a crossover design so that each participant served as her or his own control, and had participants record the number of hand-hygiene episodes during the trial using portable counting devices. Skin irritation and dryness, as reported by self-assessments by participants, visual assessments by a study nurse, and objective measurements of skin hydration, increased significantly when nurses washed their hands with soap and water. Alternatively, hand antiseptics with an ABHR was well tolerated and was not associated with increased skin irritation or dryness. Another study compared the skin condition of healthcare workers after using either a 2% chlorhexidine gluconate (CHG) handwash or an ABHR.⁸

After four weeks, participants who used the ABHR experienced significant improvements in hand skin assessment scores and visual skin condition scores compared to those who used the CHG handwash.

Finally, Winnefeld et al. assessed the skin condition of nurses using either an ABHR or a non-antiseptic handwash using clinical scores and measurements of skin barrier integrity (i.e., transepidermal water loss).¹⁷ Self-assessed skin condition and skin damage worsened significantly in the group using the handwash compared to the group using the ABHR. These studies clearly demonstrate that ABHRs are milder to the skin and better tolerated by healthcare workers compared to handwashes.

Conclusion:

Alcohol has been used as an antiseptic for centuries and was first recommended as a skin antiseptic in the early 1900s.³ Despite the studies demonstrating the efficacy of alcohol, handwashing with soap and water remained the predominant instrument of hand hygiene in the United States until the 21st century.

Due to a large body of evidence demonstrating the advantages of ABHRs, in 2002 the CDC changed its hand hygiene guidelines to recommend ABHRs for routine hand antisepsis when hands are not visibly soiled.

Despite the widespread implementation of ABHRs in healthcare facilities, misconceptions persist regarding the negative effect of ABHRs on skin conditioning and health. These concerns have been repeatedly disproven through an overwhelming amount of scientific data. In fact, handwashing has been shown to be more damaging to skin condition than ABHRs. Reducing HAIs through hand hygiene requires compliance at critical moments during patient care. Studies have estimated seven to 60 hand hygiene moments per hour; due to their skin tolerability, ABHRs are the best hand hygiene solution for these high-frequency settings.

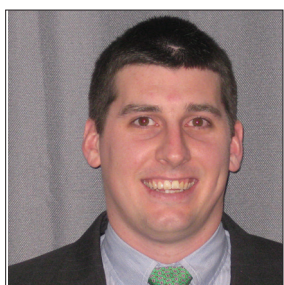
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Biography



James Bingham is a research microbiologist with GOJO industries. His current research areas include *Clostridium difficile* spore biology, antimicrobial mechanisms of action, and patient hand contamination. He holds a master's degree in food microbiology from North Carolina State University and an undergraduate degree in food science from Cornell University.



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