



By: Judy W. Murphy, RN, BSN

# CHG: FRIEND OR FOE?

## The Effect of Antimicrobial Agents on Linen

For many generations, it has been known that the best defense against infection is proper hand washing. With the increase of resistant microorganisms, the Center for Disease Control (CDC) has concentrated on efforts that would assist with decreasing the risks of infection, in specific, hand hygiene.

Representatives from the CDC carefully reviewed many research studies on various microorganisms, their mode of transmission, the ability to transfer the organisms onto surfaces and to other people, as well as on various antimicrobial agents. In the 2002 Guideline for Hand Hygiene in Health-Care Settings<sup>i</sup>, the CDC found that transmission of pathogens on hands from one to another required a series of events.

“Organisms present on the patient’s skin, or that have been shed onto inanimate objects in close proximity to the patient, must be transferred to the hands of the healthcare worker (HCW).

These organisms must then be capable of surviving for at least several minutes on the hands of personnel.

Next, hand washing or hand antisepsis by the worker must be inadequate or omitted entirely, or the agent used for hand hygiene must be inappropriate.

Finally, the contaminated hands of the caregiver must come in direct contact with another patient, or with an inanimate object that will come into direct contact with the patient.”

With the shortage of HCWs, such as nurses, nursing assistants, physicians, etc., employees are often stretched to their limits and in many cases do not do an adequate job of hand washing. Many may skip it all together. With this in mind, the CDC presented recommendations in the 2002 Guideline for Hand Hygiene in Health-Care Settings. They stated that when hands were VISIBLY soiled, hand washing was necessary. When hands are not VISIBLY soiled, the use of an alcohol-based hand rub to routinely decontaminate hands was acceptable. The CDC went on to list suggestions of when decontamination was necessary, such as before direct contact with the patient; before inserting urinary catheters, peripheral vascular catheters, etc.; after contact with body fluids, excretions, etc.; after contact with a patient’s intact skin; and more. The CDC also suggested that the HCW wash hands with an antimicrobial soap and water in all clinical situations that were described in 1C-J (1B) (69-71,74) of the guidelines.

In these guidelines, the CDC discussed the various antimicrobial agents. Of these, one in particular was the agent of choice because of its ability to kill a broad spectrum of microbes, and because of its residual properties that remain intact for up to 6 hours after use. The agent, chlorahexadine gluconate (CHG), was chosen as the “best” option in most antimicrobial soap applications. (CDC recommends a 2% or higher CHG concentration.) As a result, the use of CHG in many healthcare products has increased. It can be found in

hand soaps, peripheral and central intravenous preps, surgical preps, and more. It is now becoming the prep of choice for many surgical trays and procedural kits. In fact, many manufacturers have standardized on the CHG products for their prep solution.

Hospitals and healthcare settings are also utilizing CHG in a variety of soaps and cleansers. Brands such as Hibiclens, Endure 420, etc. actually contain a higher concentration (4%) of CHG, and are now being used as surgical preps and routine hand hygiene soaps. Studies have shown a decrease in the risk of surgical infections if patients bathe with a soap that contains a 4% concentration of CHG the night before and the morning of their surgical procedure. As a result, many hospitals have made this practice an actual protocol for many surgical procedures, including open heart procedures, large abdominal surgeries, OB perineal incision cleansing, etc. As a result of these improved outcomes, one can only anticipate that the use of CHG-based products will increase in the healthcare setting.

Many years ago, the North Mississippi Health Services laundry began to experience an increase in the amount of stained linens it was processing. This is a large laundry that services several hospitals and other healthcare facilities (nursing homes, family medical clinics, surgery centers, etc.) The stains ranged from a dingy gray to dark brownish rust in color. No matter how many times the items went through re-wash, the stains would not come out. It was at that time the laundry director, Robert Watson, contacted me to assist with investigating the possible culprit. I work as a clinical liaison for the North Mississippi Health Services laundry service and as a RN, I am familiar with the many uses (and abuses) of linens in the patient care setting.

My first contact was to several of our laundry chemical providers. The one thing that kept coming up in regards to staining concerns was a product called Hibiclens. Hibiclens is a reddish-pink colored soap that was, at this time, being used in our Women’s Health Center as an OB episiotomy/incision wound cleanser. The stains, however, were on many linen items (washcloths, towels, and even patient gowns), from most of customers and not just from the OB area. It was impossible to sort out which area the stained linen was coming from, much less the culprit causing the stains.

In delving deeper into the problem, we found that it was the CHG (part of the chemical make up of Hibiclens) that was causing the concern. This set grayish/brown stain was a result of a chemical reaction between CHG and chlorine. Once we determined that CHG was the actual culprit, I was then able to identify

the many items (IV preps, surgical preps, and the liquid hand soap used throughout our healthcare system) that contained CHG. Because the laundry was using chlorine-based bleach, any item that had CHG (visibly clear until exposed to chlorine) on it, would become stained. The inability to detect the CHG until after it had gone through the wash cycle made it impossible to sort out stained objects from non-stained objects. For example, when a washcloth that had a high concentration of the clear CHG on it was placed in a load to be washed, it leached out onto the other linen items in the wash. When these items were all exposed to the chlorine bleach in the bleaching cycle, they all became dingy and stained. The laundry was facing an overwhelming increase in the cost of linen replacement. It was imperative that we immediately go about setting up a multidisciplinary task force made up of representatives from infection control, physicians, laundry services, administration, environmental services, nursing, and others, to investigate the issues. This task force decided to take two actions:

1. The clinical side would look at the efficacy of alternative antimicrobial agents, what products would be affected, and what alternatives could be implemented.
2. The laundry and our chemical representatives would explore alternative bleaches, washing agents, etc.

The clinical task force members found a new 1% Triclosan-based hand soap alternative that could be utilized in all patient rooms and hospital settings, except for the very high-risk areas, such as the critical care units, neonatal intensive care unit, nursery, etc. Research on this new option was provided to the infection control physician and practitioners, who reviewed it and approved it for use. The clinical task force members, however, did recognize that the use of CHG in the healthcare setting was increasing and would

continue to do so. The efforts to decrease the use of CHG-based hand soap would only be offset with the increase in use of other CHG-based products.

The laundry and chemical representatives looked into the use of an oxygenated bleach (hydrogen peroxide) alternative. The only problem was that the laundry had implemented a low temp (<120 degrees) washing system, and to activate hydrogen peroxide bleach, temps must be at or above 160 degrees. The solution: increase the temperature of the tunnel washer's bleaching chamber to the higher temperature but leave the other chambers on a low temperature setting. WONDERFUL!

The task force also suggested taking the scrapped (stained) washcloths, towels, blankets, etc., dyeing them blue, and providing them to all areas throughout our facilities for use. They then developed a "Blue Rag" policy that established the blue rags as the items to use for cleaning, oil spills, waxing floors, and other linen abuse tasks and using the white linens for patient care. By distinguishing between the patient care linen items and the linen items used for other purposes, any employee, from the administrative level to the entry level, could recognize and address abuse concerns.

Also, with the use of hydrogen peroxide bleach, our customers noticed that the colors on the patient items (patient gowns, logos on towels/sheets, etc.) were much brighter and did not fade over time. Our laundry found that our linens were also lasting longer, which resulted in decreased replacement costs.

The combination of all of these actions resulted in a budget turnaround of over \$88,000 in one year. In a setting where cost containment is high priority, these efforts proved beneficial to everyone, not only in a financial sense, but in a customer satisfaction sense as well.

<sup>i</sup> Centers for Disease Control and Prevention, Guideline for Hand Hygiene in Health-Care Settings

1 LL

### CHG: Friend or Foe?

Earn one *Laundry/Linen* credit hour by completing the [quiz over the material](#) from this educational offering. To maintain ALM credentials, individuals must submit proof of continuing education in laundry & linen specific programs every three years. Access to contact hour quizzes are a benefit of membership in ALM.