

## 150 Years Later – The Promise of “Alcohol Plus” Sanitizers

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In 1847, an obstetrician by the name of Ignac Semmelweis noted that women were far more likely to die after childbirth when attended by a doctor than when the baby was delivered by a midwife. Searching for an explanation, he concluded it was because the doctors would come directly from conducting an autopsy to the maternity ward – they must be carrying something with them. When Dr. Semmelweis forced his colleagues to rinse their hands with chlorinated water, he created the first hand sanitizer; when the death rate fell precipitously, the modern understanding of hand hygiene was born.

More than 150 years later, hospitals and health care facilities are still struggling to find the best way to implement Semmelweis’ discovery. The costs of Hospital Acquired Infections (HAIs) are rising. Between five and ten percent of patients admitted will pick up an infection while in the hospital. Even more concerning, a growing percentage of these infections are resistant to antibiotics, making them deadlier – HAIs cause 88,000 deaths annually.<sup>1</sup> There are two different approaches to reversing this trend. Some experts contend that the current hand hygiene protocols, using alcohol sanitizers and handwashing, are effective, and focus on increasing compliance. Others believe that developing better sanitizing products is essential to combating infection.

Currently, the CDC only recommends hand sanitizers that contain at least sixty percent alcohol for use in hospitals. The benefits and drawbacks of alcohol-based sanitizers are well documented. The alcohol kills more than 99.99% of germs on contact by dehydrating the bacteria; unfortunately it also has the same effect on the hands. Repeated use often leads to painfully dry, irritated skin. Most importantly, once the alcohol evaporates the sanitizer is no longer effective, and the hands are subject to fresh contamination.

Results are mixed in hospitals and healthcare settings. Studies have shown a reduction in infection when an alcohol-based sanitizer is used in conjunction with handwashing.<sup>2</sup> However, it has also been demonstrated that the compliance rate is typically only about 50% in hospitals, even when a dispenser is provided for every bed, leaving half of all patients in danger.<sup>3</sup> Alcohol sanitizers have been present in hospitals for a decade, yet the anticipated improvement in infection rate has not materialized. Through training programs and checklists, it may be possible to increase sanitizer use and reduce infection, but it remains unlikely that even the most stringent of protocols can create perfect compliance – it seems that developing a better sanitizer holds more promise.

Alcohol-free sanitizers strive to provide longer-lasting protection and reduce skin irritation, but face significant challenges of their own. The antimicrobial agents are often unable to match the immediate,

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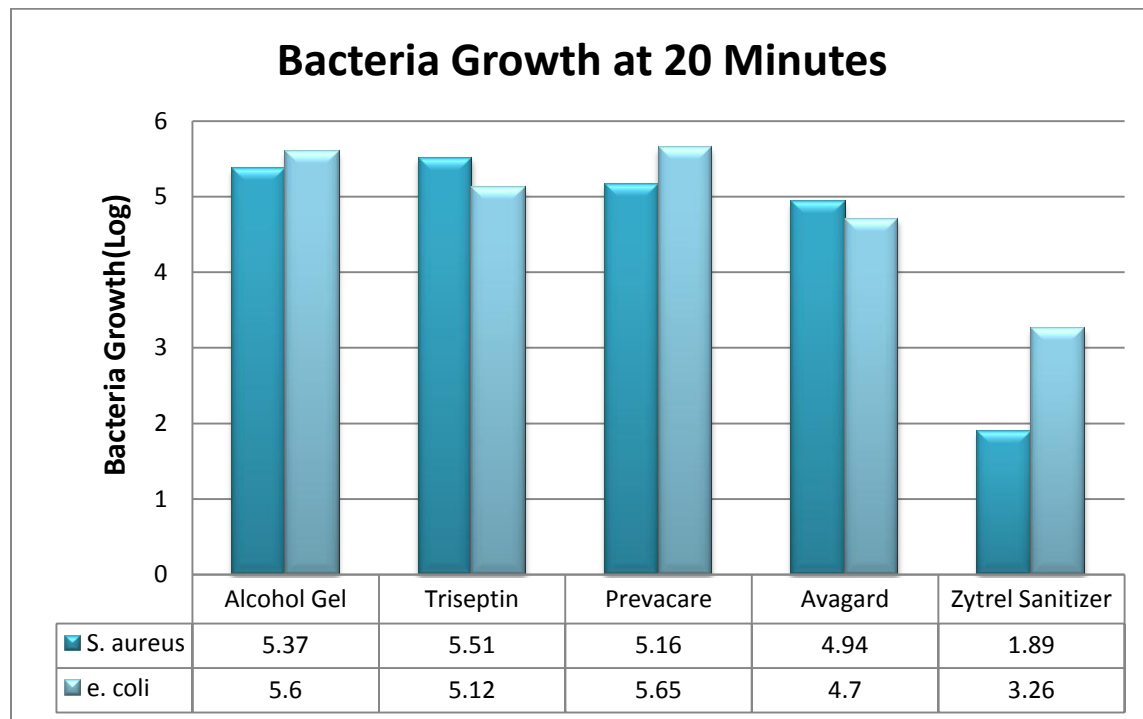
<sup>1</sup> Fendler et al, *The impact of alcohol hand sanitizer use on infection rates in an extended care facility*, Am J Infect Control 2002; 30:226-33

<sup>2</sup> Hilburn et al, *Use of alcohol hand sanitizer as an infection control strategy in an acute care facility*, Am J Infect Control 2003; 31:109-16

<sup>3</sup> Bischoff et al, *Handwashing compliance by health care workers: the impact of introducing an accessible, alcohol-based hand antiseptic*, Arch Intern Med 2000; 160:1017-1021

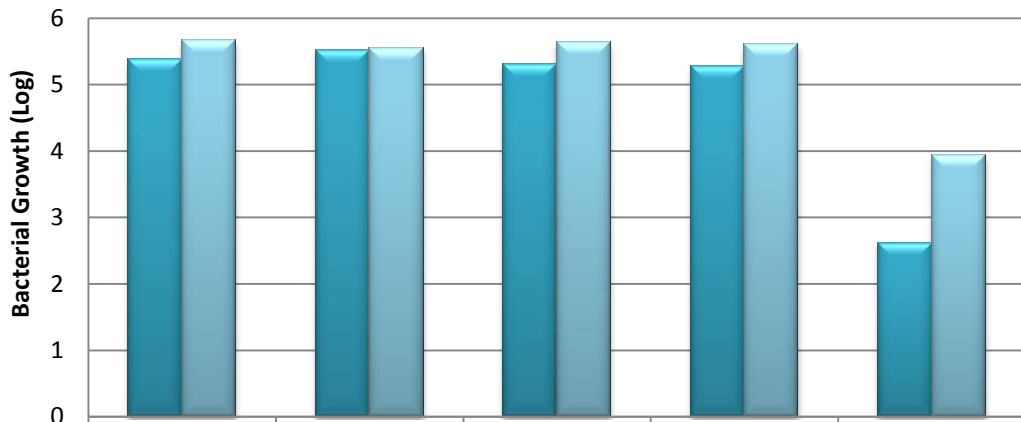
broad-spectrum kill of alcohol. In hospital or healthcare facilities, a sanitizer must be able to provide complete kill within 15 seconds of application. Other agents may cause health problems or promote resistance among bacteria. The FDA recently issued warning letters to many manufacturers of common alcohol-free sanitizers, including Safe4Hours and CleanWell products, for making misleading and unproven claims, including claims of protection against MRSA and H<sub>1</sub>N<sub>1</sub>.

Perhaps the most promising solution can be called the “Alcohol-Plus” approach. Several different products have attempted to combine the benefits of alcohol with other active ingredients that provide long-lasting protection, with various degrees of success. Scientists at Columbia University evaluated some of the leading products, determining how effective they were at killing germs at 20 and 35 minutes after they were applied. Of the products tested, only Avagard (3M) and Zytrel (Innovative BioDefense, Inc.) outperformed the alcohol control – which has no sustained effectiveness – at all tested points. Zytrel (70% alcohol and 0.2% BZT) killed more than 10 times as many germs as Avagard (61% alcohol and 1% Chlorohexidine Gluconate) at both 20 and 35 minutes, against both types of organisms tested.<sup>4</sup> Avagard is being evaluated in a clinical trial and is seeking the first FDA approval of a hand sanitizer. Both Avagard and Zytrel have undergone dermatological testing showing they produce less skin irritation than traditional alcohol-based products. The Zytrel hand sanitizer is integrated into the only complete line of sanitizing products, which also includes a moisturizing lotion and a foaming soap. All three of the Zytrel products have demonstrated the ability to continue killing germs for up to four hours after the initial application.



<sup>4</sup> Shintre, M., Gaonkar, T. Modak S., *Efficacy of an alcohol-based healthcare hand rub containing synergistic combination of farnesol and benzethonium chloride*, International Journal of Hygiene and Environmental Health 209: 477-487, 2006

## Bacteria Growth at 35 Minutes



■ S. aureus	5.38	5.52	5.31	5.28	2.62
■ e. coli	5.66	5.55	5.63	5.61	3.93

By combining the instantaneous kill of alcohol with the long-lasting protection of other antimicrobial agents, these “Alcohol-Plus” sanitizers provide the best chance of combating infection. By adding persistent kill to traditional sanitizers, doctors, nurses, and other healthcare workers can still be protected, even if they are not 100% compliant. Because the alcohol content meets CDC recommendations, these products can be used immediately in hospitals and healthcare facilities and not require any changes in protocol or equipment, possibly reducing both skin irritation and infection rates. These new sanitizers may prove to be the biggest step forward in hand hygiene since Dr. Semmelweis’ chlorinated water.