GOJO

HAND HYGIENE TIMES

Your resource for the latest news in effective infection control program development and best practices.

Issue 7 Volume 3

Understanding the variables that determine ABHR efficacy

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Both the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) agree that hand hygiene is the single most important step a caregiver can take to prevent the spread of infections in the healthcare setting.[1,2] Both CDC and WHO Hand Hygiene Guidelines recommend that soap and water should be used when hands are visibly soiled, or contaminated or after contact with spores such as Clostridium difficle. For all other moments or opportunities for hand hygiene in the healthcare setting, both guidelines state that alcohol based hand rub (ABHR) is recommended. ABHR is preferred because it offers superior antimicrobial efficacy, better skin tolerability under high frequency use, greater convenience and time savings, all of which contribute to better end user acceptability and higher compliance. In last month's newsletter we discussed the testing methods used to determine the efficacy of ABHR, and this month we will look at the factors that influence the antimicrobial efficacy of ABHR.

Volume of Product

Studies have demonstrated a direct correlation between the amount of product applied to the hands and antimicrobial efficacy regardless of alcohol concentration or formulation.[3-5] Because product dry time is directly proportional to the amount of product applied to the hands, there is a practical limit to the volume of product that can be used without disrupting healthcare workflow. If healthcare workers must use 5 mL of product to achieve efficacy, they will not have the time to rub it in until dry. The ideal product application quantity is one that minimizes workflow disruption while maintaining maximum antimicrobial efficacy.[1] It must be noted that efficacy of ABHR are often tested at unrealistically high product volumes (i.e. 5 mL). Therefore, product literature should be examined to compare the quantity of product used in Healthcare Personal Hand Wash (HCPHW) tests to realistic in-use volumes. It is important to know how much product a HCW would need to rub in to achieve transient bacteria kill on the volume of product that is dispensed during each dispenser actuation from your facilities' dispensers.

Product Format

ABHR are available in a number of different formats including rinses (i.e. un-thickened liquids), gels, foams, sprays, and wipes. Some studies have suggested that rinses provide higher efficacy than gels and foams, however, the studies contain multiple uncontrolled variables.[6-8] Therefore, no definitive conclusion can be drawn regarding which variables contribute to the perception of higher efficacy from rinses: alcohol concentration, product formulation, or product form. A recent study has demonstrated that a commonly used gel thickening system does not negatively impact ABHR efficacy in HCPHW studies.[9] Technical product literature from several ABHR manufacturers indicates that a variety of rinse, gel, and foam formulations meet FDA HCPHW requirements, whereas some failed to meet the required log reduction at application 10.[10] One study was done comparing a hospital's infection rates pre and post introduction to the foam format, and showed no significant change in infection rates after switching to foam.[9] Product format is, therefore, not a primary determinant of antimicrobial efficacy.[11]

Alcohol Concentration

Antimicrobial efficacy cannot be assumed based solely on the alcohol concentration of ABHR. Figure 1 clearly shows that antimicrobial efficacy does not correlate with alcohol concentration.[9] Two 70% formulations (Products C and D) perform significantly better at application 1 and 10 than another 70% formulation (Product B) indicating that alcohol concentration does not drive antimicrobial efficacy. Furthermore, some 70% formulations (Products C and D) perform significantly better than higher alcohol formulations

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THAT'S a FACT!

A study showed that the frequency of hand-washing with mild soap appears to increase the risk of skin dryness, but the frequency of disinfection with an ABHR is not associated with increased hand dryness. The type of soap and ABHR used were also significantly correlated to skin dryness.[1]

1. Chamorey E. et al. (2011) A prospective multicenter study evaluating skin tolerance to standard hand hygiene techniques. AM J Infection Control 2011:39:6-13.

Understanding the variables that determine ABHR efficacy

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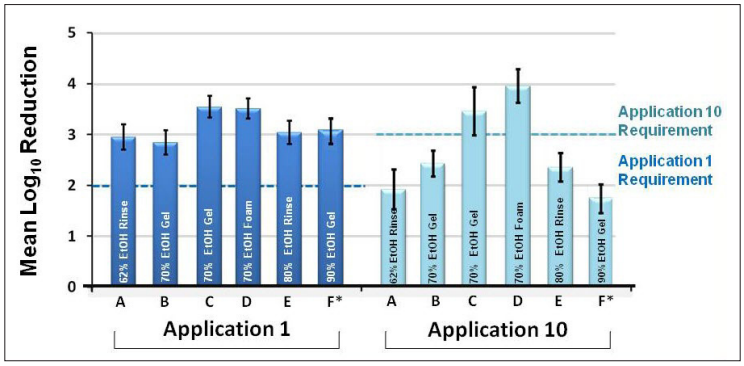


(Product E and F) indicating that increasing alcohol concentration does not correlate to increased antimicrobial efficacy. In addition, a study using a newly accepted test method designed specifically to more accurately reflect ABHR use conditions (ASTM E2755) has demonstrated that identical formulations with varying alcohol levels achieved statistically equivalent log reduction of S. marcescens.[12] These results further demonstrate that alcohol content does not drive antimicrobial efficacy as long as the alcohol concentrations are within the safe and effective range established by the FDA.

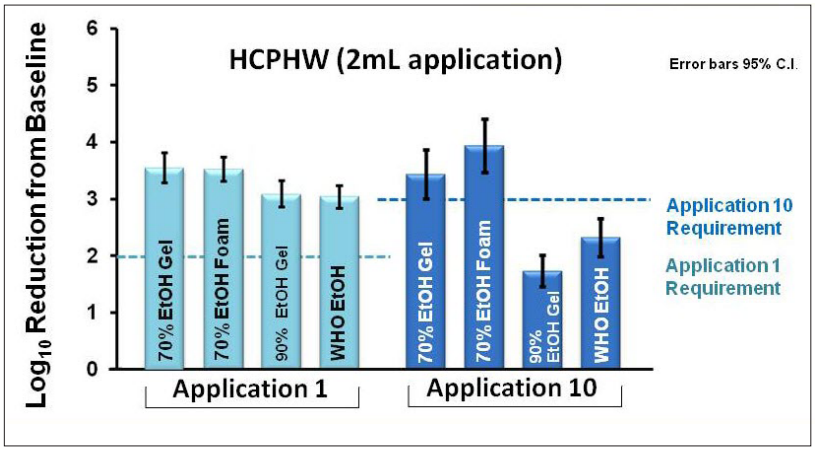
Product Formulation

Differences in antimicrobial efficacy can often be attributed to variation in product formulation. ABHR are complex formulations, combining alcohol with various ingredients to create specific attributes including skin tolerance, skin moisturization, and aesthetic properties. These additional ingredients in some cases either improve or inhibit the formulation's antimicrobial efficacy. Study results demonstrate that there's no ideal concentration of alcohol that ensures products meet FDA efficacy requirements and highlight the importance of formulation on anti-microbial efficacy.

Total product formulation and product application volume, not alcohol concentration or product form, are key determinants of the in vivo antimicrobial efficacy of ABHR. Because formulation plays an important role in ABHR antimicrobial efficacy, critical examination of HCPHW data along with the quantity of product applied to hands in the test should be conducted when comparing antimicrobial efficacy of products. Finally, hand hygiene compliance is perhaps the most critical element to achieving clinical effectiveness. For this reason, the most effective ABHR are those that balance antimicrobial efficacy with skin performance and healthcare worker acceptability to ensure maximal compliance to hand hygiene practices.

Product Feature

PURELL® ADVANCED INSTANT HAND SANITIZER FORMULATIONS



Unprecedented germ kill in skin friendly formulations

Today's PURELL® Instant Hand Sanitizer formulations are highly effective. As science changes and new pathogens emerge, we must also be prepared to improve our products to meet changing infection control environments.

Produced with 70% alcohol, PURELL Advanced formulations contain a patent–pending blend of ingredients that maximize the impact of alcohol on bacteria and maintain skin moisture and skin health. Both PURELL Advanced Instant Hand Sanitizer gel and foam formulations meet and exceed FDA Healthcare Personnel Handwash (HCPHW) requirements with an application of 2 mL while outperforming other hand sanitizer brands - even those with a higher volume of alcohol.[1]*

1 Boyce, J. M. and Pittet, D. Guideline for Hand Hygiene in Health-Care Settings. Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. Society for Healthcare Epidemiology of America/Association for Professionals in Infection Control/Infectious Diseases Society of America. MMWR Recomm. Rep. 51, 1-45, quiz (2002).

2 World Health Organization. WHO Guidelines for Hand Hygiene in Health Care. 7-202. 2009. Geneva.

3 Goroncy-Bermes, P., Koburger, T. and Meyer, B. Impact of the amount of hand rub applied in hygienic hand disinfection on the reduction of microbial counts on hands. J. Hosp. Infect. 74, 212-218 (2010).

4 Kampf, G. How effective are hand antiseptics for the postcontamination treatment of hands when used as recommended? Am. J. Infect. Control 36, 356-360 (2008).

5 Larson, E. L., Eke, P. I., Wilder, M. P. and Laughon, B. E. Quantity of soap as a variable in handwashing. Infect. Control 8, 371-375 (1987).

6 Dharan, S., Hugonnet, S., Sax, H. and Pittet, D. Comparison of waterless hand antisepsis agents at short application times: raising the flag of concern. Infect. Control Hosp. Epidemiol. 24, 160-164 (2003).

7 Kampf, G., Marschall, S., Eggerstedt, S. and Ostermeyer, C. Efficacy of ethanol-based hand foams using clinically relevant amounts: a cross-over controlled study among healthy volunteers. BMC. Infect. Dis. 10, 78 (2010).

8 Kramer, A., Rudolph, P., Kampf, G. and Pittet, D. Limited efficacy of alcohol-based hand gels. Lancet 359, 1489-1490 (2002).

9,10 Edmonds, S. E., Macinga, D. R. and Mays-Suko, P. Comparative efficacy of commercially available alcohol-based handrubs and who-recommended handrubs: which is more critical, alcohol content or product formulation? Association for Professionals in Infection Control and Epidemiology. 2011.

11 Salisbury, D. et al. (2008). The effect of instant hand sanitizer format on nosocomial infection rates: Do foam and gel instant hand sanitizer have equivalent efficacy. American Journal of Infection Control 36(5)E76-77. Abstract publication 8-71.

12 Macinga, D. R. and Beausoliel, C. M. Development of a Standard Test Method for the Clinical Evaluation of Alcohol-Based Hand Sanitizers. Interscience Conference on Antimicrobial Agents and Chemotherapy. 2008.

KEY BENEFITS OF PURELL ADVANCED FORMULATIONS

EFFICACY

This new formulation, developed with 70% ethyl alcohol, delivers unprecedented efficacy by killing 99.99% of bacteria on hands, not just in the lab. Most hand sanitizers make a 99.99% germ kill claim based on in vitro testing, only PURELL Advanced makes this claim based on in vivo testing on actual human hands.

SKIN HEALTH

While killing many germs that may cause infection, PURELL Advanced Instant Hand Sanitizer is available in moisture-rich formulations that contain four different skin conditioners proven to maintain skin health and skin moisture while improving overall skin feel.

SKIN PROTECTION TECHNOLOGY

The ability of PURELL Advanced Instant Hand Sanitizer to retain the moisture and maintain skin health sets it apart from other hand sanitizers. It's the total formulation of PURELL Advanced — the ideal amount of alcohol plus a patent-pending blend of complementary ingredients that sensitizes microbial cells to the denaturing activity of ethanol and maximizes bacterial cell membrane destruction.

FORMAT AND DISPENSING OPTIONS

PURELL® Advanced Instant Hand Sanitizer is available as a gel and a foam and in touch-free, manual and point-of-care dispensing options. We offer this range of choices to help health-care facilities provide better access to products so they can ultimately improve hand hygiene compliance.

PRODUCT COMPARISON CHART

Product Description	PURELL® Advanced with Aloe Instant Hand Sanitizer	PURELL® Advanced Instant Hand Sanitizer	PURELL® Advanced Skin Nourishing Formulations with DERMAGLYCERIN SYSTEM™
Meets and Exceeds HCPHW at 2mL[1]	✔	✔	not tested
Meets and Exceeds HCPHW at 3mL[2]	✔	✔	✔
Kills 99.99% of germs on hands[2]	✔	✔	✔
Broad-spectrum antimicrobial activity – 5 log reduction on key healthcare pathogenic bacteria	✔	✔	✔
Improve skin condition within 14 days[3,4]			✔
Maintain skin health	✔	✔	✔
Improve overall skin feel	✔	✔	✔
4 out of 5 HCWs said PURELL Advanced Formulations were soothing to the skin and/or left hands felling soft[3,4]	✔	✔	✔
Green Certified foam solutions			✔
Available in gel formats	✔	✔	✔
Available in foam formats		✔	✔
Touch-free dispensing systems	✔	✔	✔
Hypoallergenic, CHG compatible and latex and nitrile glove compatible	✔	✔	✔
Available in point of care solutions	✔	✔	✔
Solutions for patients and visitors	✔	✔	✔

Product Feature

PURELL® ADVANCED INSTANT HAND SANITIZER FORMULATIONS (continued)

GOJO will be delivering this formulation upgrade to all original, skin nourishing and aloe PURELL formulations in stages – from July 2011 through 2012. To ensure a smooth transition, there will be no change to product numbers, pricing, case packs or pallet configuration. All PURELL Advanced dispenser refills will fit in your installed PURELL dispensers. This will be a running change. As GOJO depletes its existing inventories by SKU, we will transition to PURELL Advanced.

You deserve the best from your category leader and we are offering this enhanced value to you as a product line upgrade.

For more information on PURELL Advanced visit healthcare.gojo.com/PURELLAdvanced or contact GOJO at 1-800-321-9647.

Description	Size & Dispensing	Order Number	Case Pack	Use with these dispensers
PURELL® Advanced Instant Hand Sanitizer Formulations				
FOAM				
PURELL Advanced Instant Hand Sanitizer Foam	TFX™1200 mL Refill	5392-02	2	2720-12, 2780-12, 2790-12-EEU00
PURELL Advanced Instant Hand Sanitizer Foam	TFX 1000 mL Refill	5592-02	2	2720-12, 2780-12, 2790-12-EEU00
PURELL Advanced Instant Hand Sanitizer Foam	FMX™ 1200 mL Refill	5192-03	3	5120-06
PURELL Advanced Instant Hand Sanitizer Foam	FMX 1000 mL Refill	5190-03	3	5120-06
PURELL Advanced Instant Hand Sanitizer Foam	535 mL Pump Bottle	5792-04	4	5700-06, 5704-06-BLU, 5701-12
PURELL Advanced Instant Hand Sanitizer Foam	45 mL Pump Bottle	5692-24	24	–
PURELL Advanced Skin Nourishing Instant Hand Sanitizer Foam	TFX 1000 mL Refill	5399-02	2	2720-12, 2780-12, 2790-12-EEU00
PURELL Advanced Skin Nourishing Instant Hand Sanitizer Foam	FMX 1000 mL Refill	5199-03	3	5120-06
PURELL Advanced Skin Nourishing Instant Hand Sanitizer Foam	535 mL Pump Bottle	5798-04	4	5700-06, 5704-06-BLU, 5701-12
PURELL Advanced Skin Nourishing Instant Hand Sanitizer Foam	45 mL Pump Bottle	5698-24	24	–

Description	Size & Dispensing	Order Number	Case Pack	Use with these dispensers
PURELL® Advanced Instant Hand Sanitizer Formulations				
Gel				
PURELL Advanced Instant Hand Sanitizer	TFX 1200 mL Refill	5456-04	4	2720-12, 2780-12, 2790-12-EEU00
PURELL Advanced Instant Hand Sanitizer	NXT™ 1000 mL Refill	2156-08	8	2120-06
PURELL Advanced Instant Hand Sanitizer	NXT 1000 mL Refill	2156-04	4	2120-06
PURELL Advanced Instant Hand Sanitizer	NXT 2000 mL Refill	2256-04	4	2220-08
PURELL Advanced Instant Hand Sanitizer	2 fl oz PERSONAL™ Flip-Cap Bottle	9605-24	24	–
PURELL Advanced with Aloe Instant Hand Sanitizer	TFX 1200 mL Refill	5457-04	4	2720-12, 2780-12, 2790-12-EEU00
PURELL Advanced with Aloe Instant Hand Sanitizer	NXT 1000 mL Refill	2137-08	8	2120-06
PURELL Advanced with Aloe Instant Hand Sanitizer	NXT 2000 mL Refill	2237-04	4	2220-08
PURELL Advanced Skin Nourishing Instant Hand Sanitizer*	NXT 1000 mL Refill	2151-08	8	2120-06
PURELL Advanced Skin Nourishing Instant Hand Sanitizer*	2 fl oz Pump Bottle	9648-24	24	–

* Formerly PURELL Instant Hand Sanitizer with DERMAGLYCERIN SYSTEM™

1. Healthcare Personnel Handwash Study #110103-101, April 5, 2011, BioScience Laboratories, Bozeman, MT. *Healthcare Personnel Handwash Study #100907-101, January 6, 2011, BioScience Laboratories, Bozeman, MT.
2. Healthcare Personnel Handwash Study #100635-101, September 24, 2010, BioScience Laboratories, Bozeman, MT.
3. 4-Week Clinical Field Study #2011-F10232, Akron, OH, February – March 2011.
4. 4-Week Clinical Field Study #2011-F10233, Akron, OH, February – March 2011.

A Look Ahead

next month's issue

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