Objectives
After completion of this self-study activity, the learner will be able to:
1. Explain the role of hand hygiene in reducing the incidence of healthcare-associated infections.
2. Describe the fundamental differences between the Centers for Disease Control (CDC) and the World Health Organization (WHO) hand hygiene guidelines.
3. List the indications for waterless alcohol based hand rubs.
4. Discuss the recommended placement of alcohol based hand antiseptics.

Test Questions
1. Which of the following authoritative organizations published the 2002 Guideline for Hand Hygiene in Healthcare Setting?
   a. CDC
   b. FDA
   c. OSHA
   d. WHO

2. Which of the following guidelines is identified by the Joint Commission in National Patient Safety Goal # 7?
   a. CDC
   b. Joint Commission

3. Using an alcohol based hand antiseptic is the preferred means for routine hand antisepsis.
   a. True
   b. False

4. Hands must be decontaminated by washing with soap and water immediately or as soon as feasible following contact with blood or other potentially infectious materials.
   a. True
   b. False

5. If the hands are not visibly soiled, hands should be decontaminated with an alcohol hand sanitizer in which of the following instances:
   a. before and after having direct contact with patients
   b. after contact with inanimate objects in the immediate vicinity of the patient
   c. when moving from a contaminated-body site to a clean-body site
   d. all of the above

6. Which of the following is acceptable to use prior to entering surgery for a sterile procedure:
   a. suitable antimicrobial soap and water
   b. suitable alcohol based hand antiseptic
   c. scrubbing hands and forearms with a brush for 2–6 minutes.
   d. both a and b

7. When using an alcohol based surgical hand antiseptic in preparation for a surgical procedure the WHO recommends hand washing followed by the application of enough antiseptic to keep hands and forearms wet throughout the entire hand preparation procedure.
   a. True
   b. False

8. It is acceptable to wear artificial nails in the operating room and other high-risk areas as long as the tips are less than ¼ inch long.
   a. True
   b. False
9. The WHO recommends alcohol hand antiseptic dispensers be positioned:
   a. near the entrance to every room
   b. adjacent to every sink
   c. at the point of care
   d. both a and b

10. Monitoring of hand hygiene compliance is not necessary to sustain hand hygiene compliance:
   a. True
   b. False

**Introduction**

In the United States 271 people die every day from healthcare-associated infections (HAIs) making it a critical patient safety concern. In 2009, the overall direct cost of treating HAIs was estimated to be $28 to $33 billion per year.

According to the 2002 National Nosocomial Infections Surveillance report, 4.5 HAIs occur per 100 hospital admissions and result in 99,000 associated deaths each year. An additional 1.6 million to 3.8 million infections occur annually in long-term care facilities. The cumulative impact of HAIs on the US healthcare system remains unknown as there are no reliable estimates of the infections resulting from patient care in outpatient settings.

Reduction of these infections is a critical component of healthcare quality improvement, patient safety, and controlling the cost of care.

Healthcare workers’ hands are in frequent contact with surfaces in their work environment making them the most frequent means for the transmission of pathogens. This simple fact is the reason appropriate hand hygiene is essential in the prevention of HAIs.

In 2002, the Centers for Disease Control and Prevention (CDC) Healthcare Infection Control Practices Advisory Committee published a 56 page *Guideline for Hand Hygiene in Healthcare Settings*. This important document has been the cornerstone of hand hygiene initiatives throughout the United States and around the world. This important document rapidly became the driving force behind the standardization of hand hygiene practice through its clearly articulated recommendations supported by the best available evidence. These recommendations are among the most referenced and the underpinning of a variety of prevention guidance documents, elimination guides and compliance programs offered by advocacy, professional and governmental organizations.

In 2009, the World Health Organization (WHO) published its 270 page *Guidelines on Hand Hygiene in Health Care*. The WHO guidelines gained prominence in the United States with its addition to the Joint Commission (JC) National Patient Safety Goal 7 (NPSG.07.01.01) related to reducing the risk of healthcare-associated infections. The goal requires institutions accredited through the JC to “Comply with either the current Centers for Disease Control and Prevention (CDC) hand hygiene guidelines or the current World Health Organization (WHO) hand hygiene guidelines.”

The Elements of Performance associated with NPSG.07.01.01 specify:

- Implementation of a hand hygiene program which follows all categories of IA, IB, and IC recommendations of either the current CDC or the WHO hand hygiene guidelines.
- Establish goals for the improvement of compliance with hand hygiene guidelines.
- Implement a plan to improve compliance with hand hygiene guidelines based on established goals.
- Monitoring of hand hygiene compliance is not necessary to sustain hand hygiene compliance:
  - a. True
  - b. False

Since its inclusion there have been questions regarding the differences between the two guidelines. If there are differences, what are they?

When comparing and contrasting the two guidelines it is important to begin with an understanding of the CDC and WHO, their charters, and the structure of each organization.

The CDC is a specialized agency of the US Government organized under the Department of Health and Human Services and individual states’ departments of health. It is dedicated to protecting and promoting the health and quality of life of the people and communities in the United States through the prevention and control of disease, injury, and disability. The CDC works in partnerships with state health departments and other organizations. It is part of a matrix of federal agencies, (i.e., CMS, FDA, NIH…) under the oversight of the US Department of Health and Human Services. Under this arrangement the CDC is obligated to follow the standards and test methods documented in the US code of federal regulations.

By contrast the WHO is the directing and coordinating authority for health within the United Nations (UN) system —chartered to providing leadership on global health
Indications for Hand Hygiene

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>CDC Ranking</th>
<th>WHO Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wash hands with soap and water. Visible dirt, blood, or body fluids on hands of health care worker</td>
<td>Category 1A</td>
<td>Category 1B</td>
</tr>
<tr>
<td>• Non-antimicrobial or antimicrobial soap and water</td>
<td></td>
<td>• Soap and water</td>
</tr>
<tr>
<td>If exposure to potential spore-forming pathogens hand washing with soap and water</td>
<td>No recommendation</td>
<td>Category 1B</td>
</tr>
<tr>
<td>Use alcohol based handrub as the preferred means for routine hand antisepsis in all other clinical situations (Below)</td>
<td>Category 1A</td>
<td>Category 1A</td>
</tr>
<tr>
<td>• Not visibly soiled</td>
<td>• Not visibly soiled</td>
<td></td>
</tr>
<tr>
<td>1B</td>
<td>1B</td>
<td></td>
</tr>
<tr>
<td>• Visible soil use antimicrobial soap and water</td>
<td>1B</td>
<td>1B</td>
</tr>
<tr>
<td>• Before patient contact</td>
<td>Category 1B</td>
<td>Category 1B</td>
</tr>
<tr>
<td>• After patient contact</td>
<td>Category 1B</td>
<td>Category 1B</td>
</tr>
<tr>
<td>• Before handling invasive device regardless of whether or not gloves are used</td>
<td>Category 1B</td>
<td>Category 1B</td>
</tr>
<tr>
<td>• After contact with body fluids or excretions, mucus membranes, non-intact skin, or wound dressings</td>
<td>Category 1A</td>
<td>Category 1A</td>
</tr>
<tr>
<td>• If moving from contaminated patient body site to clean site during care of same patient</td>
<td>Category 1B</td>
<td>Category 1B</td>
</tr>
<tr>
<td>• After contact with inanimate surfaces and objects (including medical equipment)</td>
<td>Category II</td>
<td>Category 1B</td>
</tr>
<tr>
<td>• After removing non-sterile gloves</td>
<td>Category 1B</td>
<td>Category 1B</td>
</tr>
<tr>
<td>• Before handling medication or preparing food perform hand hygiene using an alcohol based handrub or wash hands</td>
<td>Category 1B</td>
<td>Category 1B</td>
</tr>
</tbody>
</table>
Professional Education & Training

NPSG.07.01.01 may provide a clearer understanding of how the two guidelines relate to one another. The table on p. 76 compares the IA, IB, and IC consensus recommendations excerpted from both the CDC and WHO hand hygiene guidelines.

Compliance Monitoring
My Five Moments for Hand Hygiene
Currently there is no standard methodology universally applied to compliance monitoring. The lack of uniformity results in a variability of hand hygiene compliance rates: a poor indicator of an institution’s actual compliance with the elements of appropriate hand hygiene. An easily recognizable method of communicating proper hand hygiene is essential to improving compliance. The WHO created a symbolic interpretation of their guideline’s Indications for Hand Hygiene which prompts healthcare workers to practice appropriate hand hygiene. My Five Moments for Hand Hygiene has become an instantly recognizable visual cue for hand hygiene around the world. The success of this simple device is an example of commercial marketing strategies applied to healthcare improvement. The WHO has improved on early efforts to implement science-based guidelines, which are regularly unsuccessful, by presenting the information in a simple, concise and appealing way.

Proper Use of Alcohol Hand Antiseptics
Alcohol hand antiseptics are the preferred means for routine hand antisepsis. Several factors linked efficacy of alcohol based hand antiseptics including the type of alcohol used, concentration of alcohol, volume of alcohol used, contact time with skin and whether the hands are wet when the alcohol is applied. The minimum volume required for effectiveness varies with the size of the hands and the form in which the alcohol is delivered. Proper application requires dispensing enough alcohol based hand antiseptic to wet all surfaces of the fingers and hands so they remain damp for a minimum of 15 seconds. Few manufacturers’ instructions contain this information which creates the need for application technique to be included in training and policies and procedures.

Proper Use of Alcohol Hand Antiseptics

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>CDC Ranking5</th>
<th>WHO Ranking6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply a palmful of alcohol based handrub and cover all surfaces of the hands. Rub hands until dry.</td>
<td>1B • Follow manufacturer’s recommendation</td>
<td>1B • Specifies application technique specified</td>
</tr>
<tr>
<td>When washing hands with soap and water, wet hands with water and apply the amount of product necessary to cover all surfaces.</td>
<td>1B • Duration of wash 15 seconds</td>
<td>1B • Specifies application technique specified</td>
</tr>
<tr>
<td>• Rinse hands with water</td>
<td>1B • No application technique specified</td>
<td>1B • Makes sure towels are not used multiple times or by multiple people</td>
</tr>
<tr>
<td>• Dry thoroughly with a single-use towel</td>
<td>1B • Specifies disposable towel</td>
<td></td>
</tr>
<tr>
<td>• Avoid use of very hot water to decrease risk of dermatitis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Use a towel to turn off faucet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antimicrobial-impregnated wipes may be considered as an alternative to washing hands with non-antimicrobial soap and water.</td>
<td>1B • Alternative to nonantimicrobial soap and water not effective as alcohol based hand rubs</td>
<td>No Recommendation</td>
</tr>
</tbody>
</table>
Surgical Hand Preparation

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>CDC Ranking5</th>
<th>WHO Ranking6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artificial nails/extenders are prohibited</td>
<td>1A</td>
<td>1A</td>
</tr>
<tr>
<td>• Critical care &amp; procedural areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brushes are not recommended for surgical hand preparation</td>
<td>No Recommendation</td>
<td>1B</td>
</tr>
<tr>
<td>Surgical hand antisepsis should be performed using either a suitable antimicrobial soap or suitable alcohol based handrub before donning sterile gloves</td>
<td>1B</td>
<td>1B</td>
</tr>
<tr>
<td>• Specifies “alcohol based surgical scrub with persistent activity”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>When performing surgical hand antisepsis using an antimicrobial soap, scrub hands and forearms for the length of time recommended by the manufacturer, usually 2–6 minutes. Long scrub times (e.g., 10 minutes) are not necessary</td>
<td>1B</td>
<td>1B</td>
</tr>
<tr>
<td>When using an alcohol based handrub, use sufficient product to keep hands and forearms wet with the handrub throughout the surgical hand preparation procedure</td>
<td>1B</td>
<td>1B</td>
</tr>
<tr>
<td>• Application per manufacturers instructions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Before applying prewash hands and forearms with a non-antimicrobial soap and dry completely</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Surgical Hand Preparation with Alcohol Based Surgical Hand Antiseptics**

Alcohol based surgical hand antiseptics have demonstrated equal or superior efficacy to aqueous based antiseptic products currently available for preoperative surgical hand preparation.\(^5,6\) There is wide spread discussion concerning the need for a “pre scrub”, “pre wash” and “first scrub of the day,” according to Widmer, et al. None of these practices are necessary before using an alcohol based surgical hand antiseptic unless hands are visibly soiled.\(^13\) The WHO suggests that all members of the surgical team clean their hands when entering the surgical area by washing with a plain soap and water then thoroughly drying them.\(^6\)

**Selection of Hand Hygiene Agents**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>CDC Ranking5</th>
<th>WHO Ranking6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide HCWs with efficacious products that have low irritancy potential</td>
<td>1B</td>
<td>1B</td>
</tr>
<tr>
<td>Maximize acceptance in product selection</td>
<td>1B</td>
<td>1B</td>
</tr>
<tr>
<td>• Solicit input from HCWs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Include cost as factor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solicit information from manufacturers about the risk of product contamination</td>
<td>No Recommendation</td>
<td>1B</td>
</tr>
<tr>
<td>Ensure that dispensers are accessible at the point of care</td>
<td>No Recommendation</td>
<td>1B</td>
</tr>
<tr>
<td>Ensure that the dispenser system for alcohol based handrubs is approved for flammable materials</td>
<td>1C</td>
<td>1C</td>
</tr>
<tr>
<td>• Store alcohol based hand rubs in areas approved for flammable materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solicit and evaluate information from manufacturers regarding any effect that hand lotions, creams or alcohol based handrubs may have on the effects of antimicrobial soaps being used in the institution</td>
<td>1B</td>
<td>1B</td>
</tr>
<tr>
<td>Do not add soap a partially empty soap dispenser</td>
<td>1A</td>
<td>1A</td>
</tr>
</tbody>
</table>
Efficacious Products

There has been confusion between the WHO guidelines consensus recommendation which states, “Provide HCWs with efficacious products that have low irritancy potential” and language taken from Part 1 section 12 of the WHO guidelines entitled “WHO-recommended handrub formulation.”¹⁶

It has been asserted that any alcohol based hand antiseptics containing ethanol in concentrations below 80% volume/volume or isopropyl alcohol 75% volume/volume are neither effective nor do they meet the WHO guidelines. These claims are based on the “alcohol based handrub formulations for local production” which the WHO provides as an alternative when suitable commercial products are either unavailable or too costly. The authors go on to say “Healthcare settings currently using commercially-available handrubs should continue to use them, provided that they meet recognized standards for microbicidal efficacy (ASTM or EN standards) and are well accepted/tolerated by HCWs.”¹⁶

Alcohol based hand antiseptics commercially-available in the US must meet the FDA criteria of being ethyl alcohol between 60 and 90 percent concentration by volume.¹⁴ The FDA does not currently list isopropyl alcohol as an active ingredient which is known to be safe and effective for use in hand antiseptics. Healthcare hand antiseptics sold in the US are required to have either met or exceeded the minimum standards described in the Tentative Final Monograph for OTC Healthcare Antiseptic Drug Products.¹⁴

Point of Care

The recommendation to “ensure dispensers are accessible at the point of care (IB)” does not appear in the CDC guideline.⁶ A study by Pittet, et al. which looked at hand hygiene practice among physicians found that alcohol based hand antiseptic immediate availability at the point of patient contact was an independent predictor of compliance with appropriate hand hygiene practice.¹⁵ More recently Thomas, et al. found the conspicuous placement of alcohol based hand antiseptic dispensers (i.e., at the point of patient care) resulted in “statistically and clinically significant increases” in hand hygiene compliance.¹⁶ The proximity of the dispenser to the point of care was shown to be of greater value then a general increase in the number of dispensers. The positioning of dispensers at the point of care, by means of adaptive mounting accessories, is a highly effective strategy for increasing hand hygiene compliance.¹⁶
Monitor and Performance Feedback

The monitoring of healthcare worker compliance with all appropriate hand hygiene practices is accepted as an important tool in the compliance improvement process and is therefore a reasonable expectation. The WHO guideline stresses the importance of monitoring based on the appropriate response to hand hygiene opportunities as defined by the five moments model. Eveillard, et al. reported the “gold standard” is direct observation of healthcare workers by trained personnel for compliance at each opportunity as defined in five moments model. However, such observational monitoring has been found to be resource intensive, time-consuming, and challenging, due to the potential for compromising patient privacy. At present the comparison of compliance rates between facilities is highly problematic due to the lack of standardized criteria for compliance and observation techniques. For example, many US hospitals have adopted the model used in the JC’s, Center for Transforming Healthcare hand hygiene project which measures healthcare workers’ compliance of hand hygiene upon entering and exiting the patient room. This “wash in/wash out” model has the potential to produce an overestimation of the overall percentage of compliance when compared to healthcare workers measured against compliance with the five moments model.

Monitoring compliance based on the usage of hand hygiene products is discussed in the WHO guideline as a practical but indirect approach to determining an institution’s baseline and subsequent changes in compliance rates. This method requires less time and fewer resources.
The monitoring of healthcare worker compliance with all appropriate hand hygiene practices is accepted as an important tool in the compliance improvement process and is therefore a reasonable expectation.

resources but is not necessarily less complicated. Monitoring product use as a sole indicator of hand hygiene compliance is not recommended as it does not allow healthcare workers to receive individual performance feedback regarding their compliance. Neither does it allow for the identification of improvements in workflow or allow for detailed analysis of hand hygiene compliance by the shift, clinical unit, or by the type of healthcare worker. Boyce observed there is no clear correlation between product usage and healthcare worker compliance established by the observational method.18

The electronic monitoring of hand hygiene compliance is a rapidly evolving technology. These automated hand hygiene compliance monitoring systems are intended to provide continuous, unbiased, quantitative measurement of hand hygiene activity. In a study published in 2009, Boyce, et al. reported on the trial of a prototype electronic system which provided specific data, such as how often healthcare workers dispensed alcohol based hand antiseptic, hand hygiene rates before and after various improvement interventions, and dispenser use patterns.19 For the moment, no system is capable of detecting the appropriateness of the dispensing of soap or alcohol based hand antiseptic with hand hygiene opportunities as defined by the five moments model.4,10

Conclusion

There is little difference between the consensus recommendations of the CDC Guideline for Hand Hygiene in Healthcare Setting) published in 2002, and the 2009 WHO Guidelines on Hand Hygiene in Health Care.5,6 Building upon the 2002 CDC guidelines, the WHO guideline expands guidance to include detailed suggestions for the implementation of training, observation, and performance reporting based on the five moments model.4,10 It should be noted not all of the improvement strategies, stated norms or standards proposed in the WHO guideline will comply with US federal, state or local laws, codes and regulations. The WHO guideline and toolbox are a comprehensive resource with something to offer any healthcare facility worldwide, irrespective of their available resources.20 The guideline and all of the related tools are available at: http://www.who.int/gpsc/tools/en/.

References

16. Bruce W. Thomas, DO; Gina M. Berg-Copas, PhD; Donald G. Vasquez, DO, MPH; Blandy L. Jackson, RN; Ruth Wetta-Hall, RN,
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City ___________________________ State ______ Zip Code ______

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4. Date the application and sign.
5. Answer the true/false CE questions. KEEP A COPY FOR YOUR RECORDS.
6. Submit this form and the answer sheet to:

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7. For questions, contact craig@firstaccessmedia.com.

8. Participants who score at least 70% will receive a certificate of completion within 30 days of healthVIE.com’s receipt of the application.

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Mailing Address ________________________________________

City, State, Country, Zip ________________________________

Daytime phone ( ______ ) ________________________________

Position/Title _________________________________________

Social Security or Nursing License Number ________________

Date application submitted ______________________________

Signature _____________________________________________

Offer expires April 2016

On a scale of 1-5, 5 being Excellent and 1 being Poor, please rate this program for the following:

1) Overall content ____________________
2) Met written objectives __________________
3) Usability of content __________________

Greg Skorczewski, OPA-C is a Certified Orthopedic Physicians Assistant who currently works as a Technical Service Specialist within 3M’s Infection Prevention Division Laboratory where he supports development of hand hygiene products and the medical professionals who use those products. His experience includes a broad range of responsibilities in diverse clinical settings both as a nurse and as a physician extender. He has lectured extensively in Asia, Latin American and the U.S. on the prevention of surgical site infections, antimicrobials and hand hygiene. Greg is a member of APIC, AORN and ASOPA.

ANSWERS

1. a 6. d
2. d 7. b
3. a 8. b
4. a 9. c
5. d 10. b

<04/2011>