

Core Concepts for Hand Hygiene: Clean Hands for Healthcare Personnel



Presenter

Russ Olmsted, MPH, CIC

Director, Infection Prevention & Control
Trinity Health, Livonia, MI

Contributions by

Heather M. Gilmartin, NP, PhD, CIC

Denver VA Medical Center
University of Colorado

Laraine Washer, MD

University of Michigan Health System



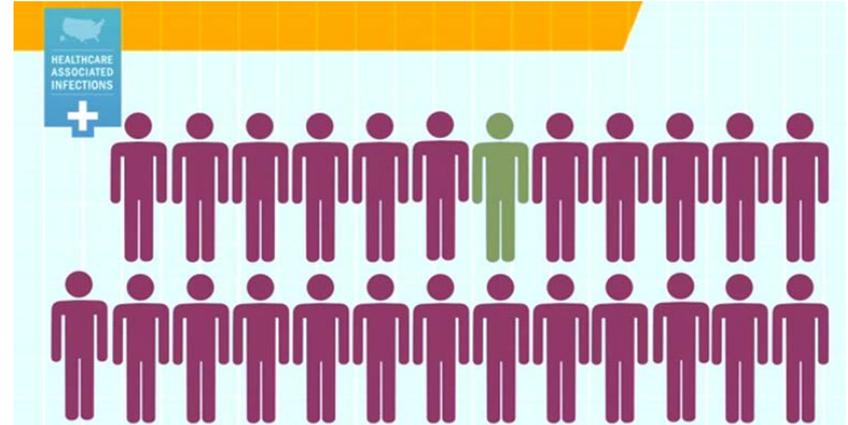
Learning Objectives

- Outline the importance of effective hand hygiene for protection of healthcare personnel and patients
- Describe proper hand hygiene techniques, including when various techniques should be used



Why is Hand Hygiene Important?

- The microbes that cause healthcare-associated infections (HAIs) can be transmitted on the hands of healthcare personnel
- Hand hygiene is one of the MOST important ways to prevent the spread of infection
- Too often healthcare personnel do not clean their hands
 - In fact, missed opportunities for hand hygiene can be as high as 50%

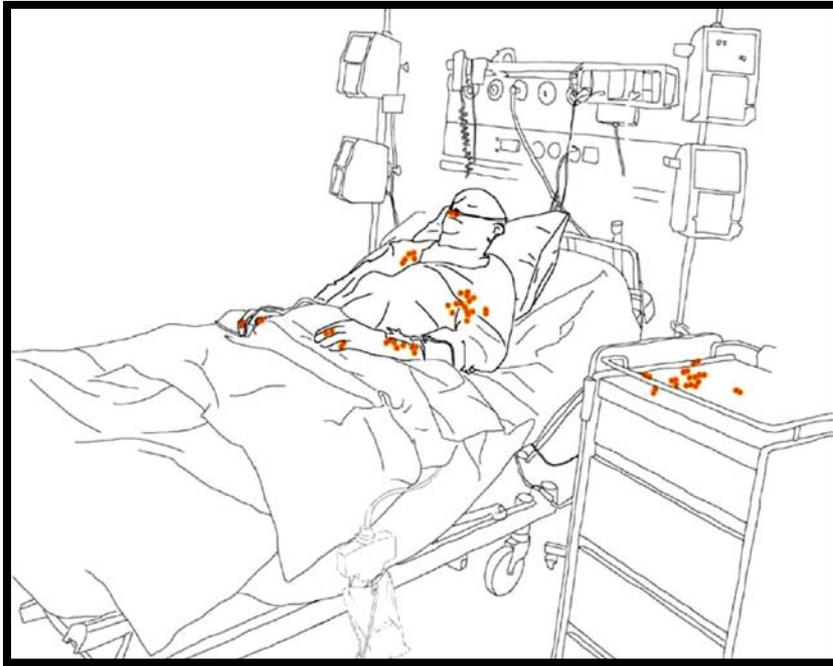


1 out of every 25 patients has a healthcare-associated infection

(Chassin MR, Jt Comm J Qual Patient Saf, 2015; Yanke E, Am J Infect Control, 2015; Magill SS, N Engl J Med, 2014)



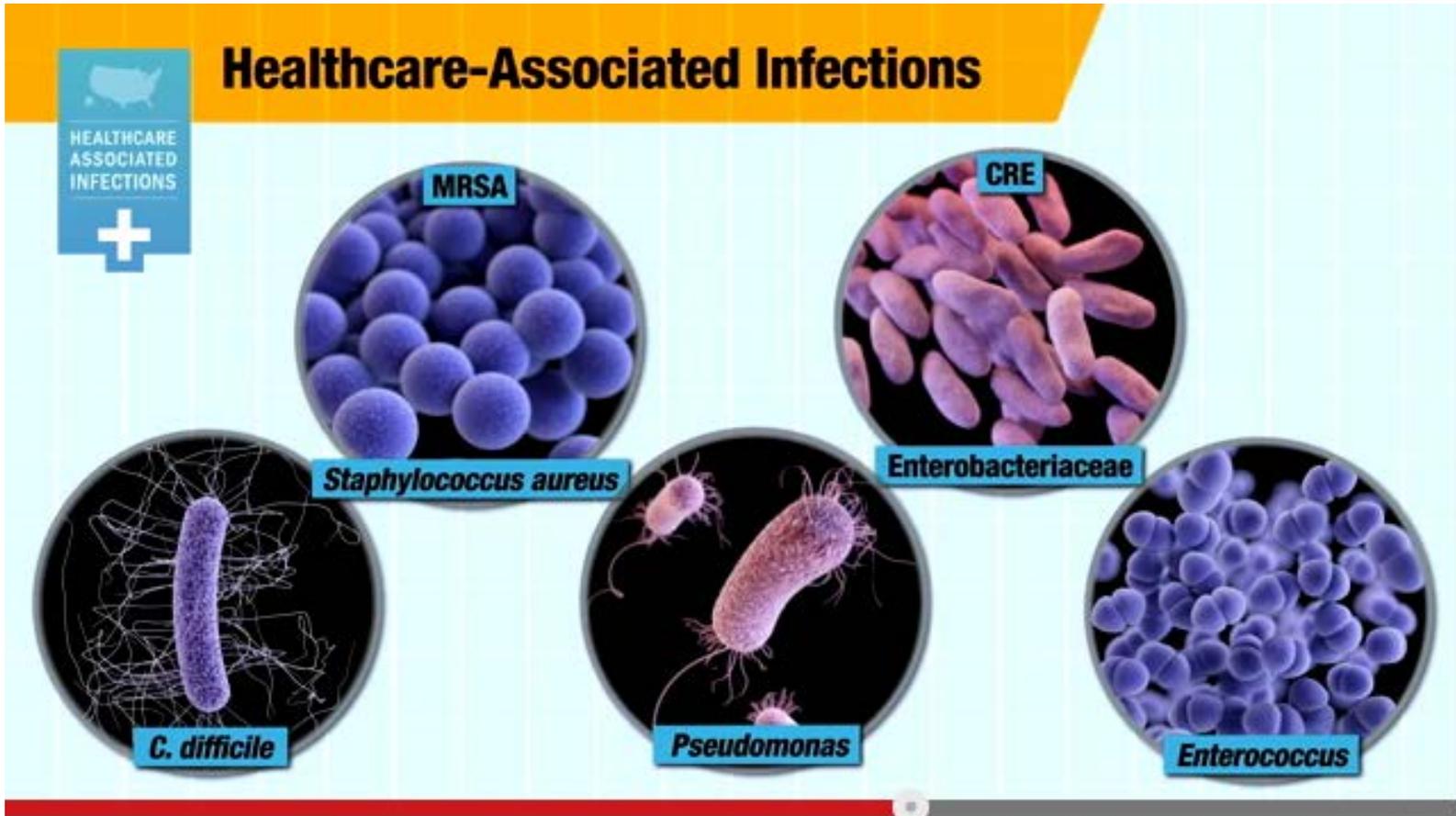
Environmental Surfaces Can Look Clean but...



- Bacteria can survive for days on patient care equipment and other surfaces like bed rails, IV pumps, etc.
- It is important to use hand hygiene after touching these surfaces and at exit, even if you only touched environmental surfaces



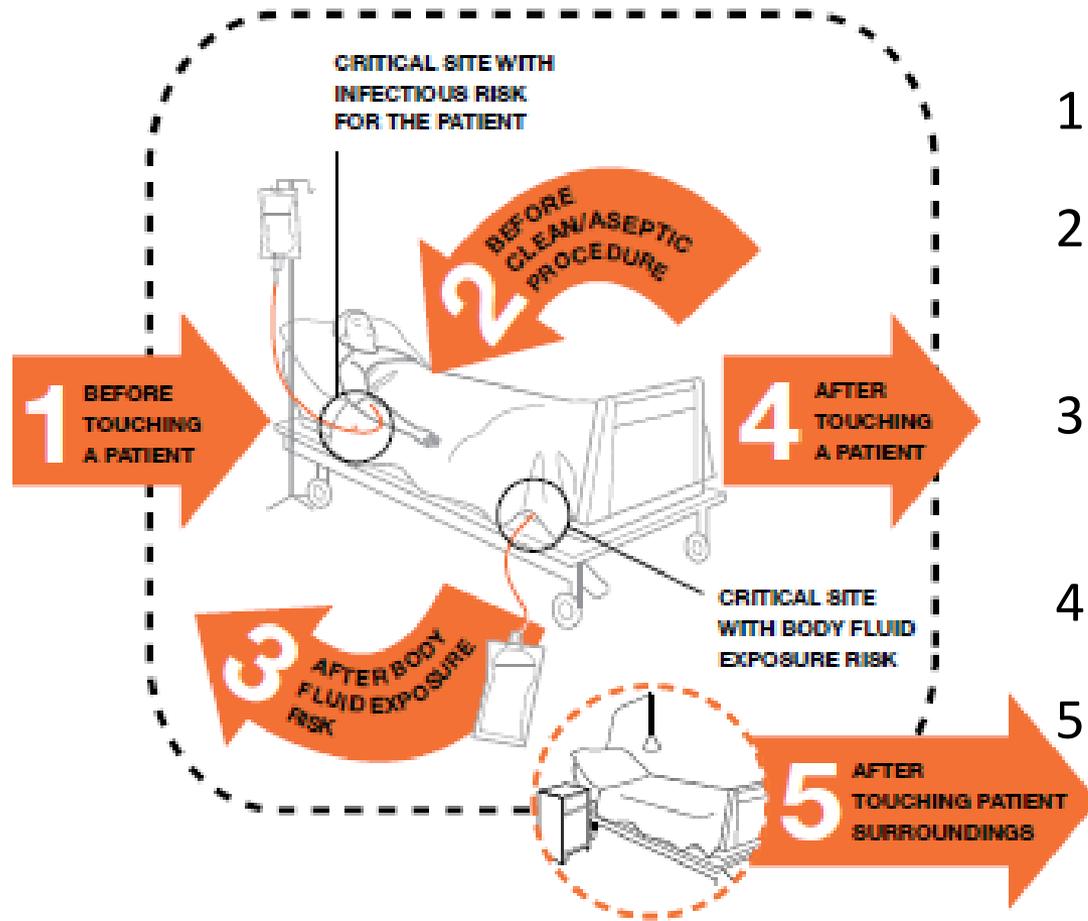
Hands Make Multidrug-Resistant Organisms (MDROs) and Other Microbes Mobile



(Image from CDC, *Vital Signs: MMWR*, 2016)



When Should You Clean Your Hands?

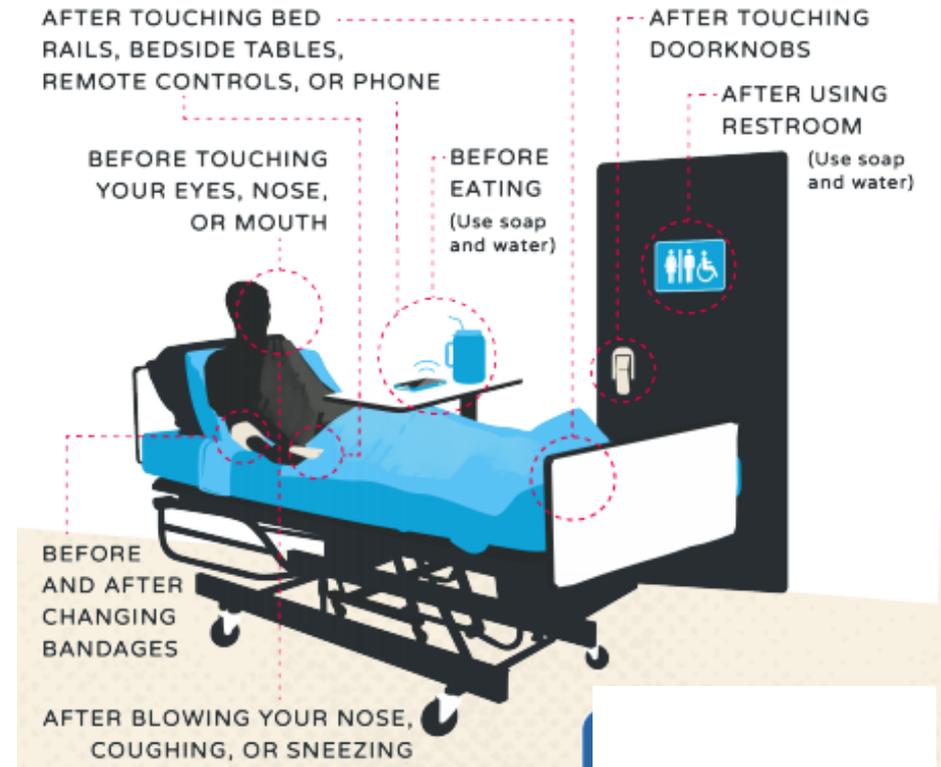


1. Before touching a patient
2. Before providing a clean/aseptic procedure
3. After direct contact with body fluid
4. After touching a patient
5. After touching surfaces around a patient



Partnering With Patients for Hand Hygiene

- Healthcare personnel should encourage patients, families and visitors to clean their hands
- Moments for patients to perform hand hygiene are:
 - Before or after touching invasive devices or bandages
 - e.g. IV, surgical site, feeding tube
 - Before eating
 - After using the restroom or handling a bedpan
 - When entering or leaving their room



Empowering Patients to Speak Up

Encourage patients to not be afraid to use their voice - that it's ok to ask their healthcare provider questions, such as:

- “I didn’t see you clean your hands when you came in, would you mind cleaning them again before you examine me?”
- “I’m worried about germs spreading in the hospital. Will you please clean your hands once more before you start my treatment?”



Hand Hygiene Methods

Hand hygiene applies to use of either alcohol-based hand rub or the use of soap and water. Specific methods include:

- **Alcohol-based hand rub**
 - Rubbing hands with an alcohol-containing hand hygiene product
- **Handwashing**
 - Washing hands with plain soap and water
- **Antiseptic hand wash**
 - Washing hands with water and soap or other detergents containing an antiseptic agent
- **Surgical hand hygiene/antiseptis**
 - Handwashing with antiseptic soap or using an alcohol-based hand rub before providing surgery



Which Method Kills Bacteria Better?



(Boyce JM, Am J Infect Control, 2002; WHO Guidelines on Hand Hygiene in Health Care, WHO, 2009)



What Are the Benefits of Alcohol-Based hand rubs?

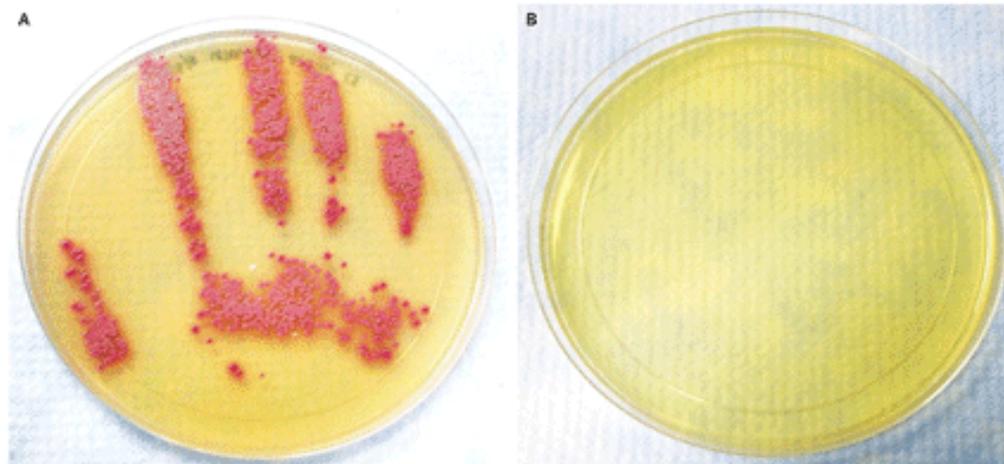


- Requires less time
- More effective than washing with soap and water
- More accessible than sinks
- Reduces bacterial counts on hands
- Improves skin condition



A Picture of the Power of Hand Hygiene

- Panel A (left): Culture of healthcare personnel's hand following ungloved abdominal exam of a patient – colonized with methicillin-resistant *S. aureus* (MRSA)
- Panel B (right): Same personnel's hand after application of alcohol-based hand rub



(Donskey CJ, *N Engl J Med*, 2009)



Choosing the Right Alcohol-Based Hand Rub and Using the Correct Technique

Hand Rub (foam or gel)

1. Select an alcohol-based hand rub that is between 62% and 90% alcohol.
2. Apply to palm of one hand (the amount used depends on specific hand rub product)
3. Rub hands together, covering all surfaces, focusing in particular on the fingertips, fingernails, and underneath fingernails, until dry



(Image from Healthcare Providers. Clean Hands Count Campaign, CDC)

Kills more than 99.99% of most common germs that may make you sick

Drug Facts	
Active ingredient	Purpose
Ethyl alcohol 70% v/v.....	Antimicrobial

Uses

- Hand sanitizer to help reduce bacteria on the skin that could cause disease
- Recommended for repeated use

Warnings

Flammable. Keep away from fire or flame.

For external use only

When using this product do not use in or near the eyes. In case of contact, rinse eyes thoroughly with water.

Stop use and ask a doctor if irritation or rash appears and lasts

Keep out of reach of children. If swallowed, get medical help or contact a Poison Control Center right away.

Directions

- Put enough product in your palm to cover hands and rub hands together briskly until dry
- Children under 6 years of age should be supervised when using PURELL

Other information

- Store below 110°F (43°C)
- May discolor certain fabrics or surfaces

Inactive ingredients Water (Aqua), Isopropyl Alcohol, Caprylyl Glycol, Glycerin, Isopropyl Myristate, Tocopheryl Acetate, Acrylates/C10-30 Alkyl Acrylate Crosspolymer, Aminomethyl Propanol, Fragrance (Parfum)



Hand Washing Technique

Hand Washing (soap and water)

1. Wet hands with water
2. Apply soap
3. Rub hands together for at least 15 seconds, covering all surfaces, focusing on fingertips and underneath fingernails
4. Rinse under running water and dry with disposable towel
5. Use the towel to turn off the faucet



Myth Busters Around Hand Hygiene

TRUTH:

Alcohol-based hand sanitizer does not kill *C. difficile*, but it is still the overall recommended method for hand hygiene practice.

THE NITTY GRITTY:

Always use gloves when caring for patients with *C. difficile*. In addition, when there is an outbreak of *C. difficile* in your facility, wash your hands with soap and water after removing your gloves.

Hand hygiene method for *patient* with *Clostridium difficile* infection?

Step 1. Put on gloves!

Step 2. Consider RUB IN (using hand rub)...& WASH OUT (soap)



(Healthcare Providers. Clean Hands Count Campaign, CDC Website <http://www.cdc.gov/handhygiene/providers/index.html>)



Myth Busters Around Hand Hygiene



Where are the microbes?...Make sure you clean under nails and fingertips

(Healthcare Providers. Clean Hands Count Campaign, CDC Website, <http://www.cdc.gov/handhygiene/providers/index.html>)



Myth Busters Around Hand Hygiene

TRUTH:

The amount of product you use matters.

THE NITTY GRITTY :

Use enough alcohol-based hand sanitizer to cover all surfaces of your hands. Rub your hands together until they are dry. Your hands should stay wet for around 20 seconds if you used the right amount.

TRUTH:

Glove use is not a substitute for cleaning your hands. Dirty gloves can soil your hands.

THE NITTY GRITTY :

Clean your hands after removing gloves to protect yourself and your patients from infection.

Use enough hand hygiene product

Using gloves does not mean hand hygiene can be skipped!

(Healthcare Providers. Clean Hands Count Campaign, CDC Website, <http://www.cdc.gov/handhygiene/providers/index.html>)



References

- Boyce JM, Pittet D. Healthcare Infection Control Practices Advisory Committee: HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. 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. *Am J Infection Control* 2002; 30(8):S1-S46.
- Chassin MR, Mayer C, Nether K. Improving hand hygiene at eight hospitals in the United States by targeting specific causes of noncompliance. *Jt Comm J Qual Patient Saf.* 2015; 41(1):4-12.
- Clean Hands Count for Healthcare Providers. Centers for Disease Control and Prevention. <http://www.cdc.gov/handhygiene/providers/index.html>
- Donskey CJ, Eckstein BC. Images in clinical medicine. The hands give it away. *N Engl J Med.* 2009; 360(3):e3.
- FitzGerald G, Moore G, Wilson AP. Hand hygiene after touching a patient's surroundings: the opportunities most commonly missed. *J Hosp Infect.* 2013; 84(1):27-31.
- Guideline for Hand Hygiene in Healthcare Settings. Center for Disease Control and Prevention. <https://www.cdc.gov/handhygiene/providers/guideline.html>
- Magill SS, Edwards JR, Bamberg W, et al. Multistate point-prevalence survey of health care–associated infections. *N Engl J Med.* 2014; 370(13):1198-208.
- Patients and Visitors. Clean Hands Count. Centers for Disease Control and Prevention, CDC. Available at <https://www.cdc.gov/handhygiene/pdfs/patient-factsheet-508.pdf>
- Pittet D, Allegranzi B, Sax H, et al. Evidence-based model for hand transmission during patient care and the role of improved practices. *Lancet Infect Dis.* 2006; 6(10):641-52.
- Sunkesula VCK, Knighton S, Zabarsky TF, et al. Four Moments for Patient Hand Hygiene: A Patient-Centered, Provider-Facilitated Model to Improve Patient Hand Hygiene. *Infect. Control Hosp. Epidemiol.* 2015; 36:986–989.
- Vital Signs: Preventing Antibiotic-Resistant Infections in Hospitals — United States. Centers for Disease Control and Prevention. *MMWR* 2016;65:235-41.
- WHO Guidelines on Hand Hygiene in Health Care. World Health Organization (WHO). Published 2009. Available at <http://www.who.int/gpsc/5may/tools/9789241597906/en/>
- Yanke E, Zellmer C, Van Hoof S, et al. Understanding the current state of infection prevention to prevent *Clostridium difficile* infection: a human factors and systems engineering approach. *Am J Infect Control.* 2015; 43(3):241-7. <https://www.cdc.gov/handhygiene/providers/guideline.html>



THANK YOU!



SPEAKER NOTES



Speaker Notes: Slide 1

Welcome to this module titled “Core Concepts for Hand Hygiene: Clean Hands for Healthcare Personnel.” We will review the critical role of hand hygiene as a foundation for preventing healthcare-associated infections.

Hand hygiene is one of the most important interventions to prevent the transmission of microorganisms on the hands of healthcare personnel. Proper hand hygiene removes those microbes and prevents exposure to patients during care delivery. Let’s learn more about this foundation for preventing infection and keeping patients safe.



Speaker Notes: Slide 2

The content for this module was developed by Russ Olmsted, Director of Infection Prevention and Control at Trinity Health, in Livonia, Michigan and informed by a multidisciplinary team of physicians, nurses and infection preventionists dedicated to improving patient safety and infection prevention efforts. In particular, we would like to thank and acknowledge doctors Heather Gilmartin and Laraine Washer and the STRIVE national project team for their contributions and review of this module.



Speaker Notes: Slide 3

This module will outline the importance for healthcare personnel to clean their hands to protect their patients and themselves. It will also review methods for hand hygiene. Hand hygiene includes washing with soap and water, or using alcohol-based hand rub – some use the term hand sanitizer in place of hand rub. We'll also learn when healthcare personnel should clean their hands – specifically, the moments for hand hygiene.



Speaker Notes: Slide 4

So why is hand hygiene so important for providing safe care to patients?

The reason is that many healthcare-associated infections, or HAIs, can be transmitted on the hands of healthcare personnel. One out of every 25 patients has a healthcare-associated infection and of these one out of every nine will die from the infection. Hand hygiene, therefore, is one of the most important steps healthcare personnel can use to keep patients safe. However, despite this awareness by personnel, observers of adherence to hand hygiene by healthcare personnel find it is missed in 50 percent of opportunities.



Speaker Notes: Slide 4 Continued

Importantly, this is true even when caring for patients on contact precautions for *Clostridioides difficile* infection (CDI). One study found that the frequency of cleaning hands by personnel when leaving the patient's room used for contact precautions for *Clostridioides difficile* infection ranged between 23 to 55 percent.

Now, let's take a closer look at one of these opportunities when hand hygiene is often not performed.



Speaker Notes: Slide 5

Environmental surfaces immediately around or near the patient can look clean but often are contaminated. As a result, healthcare personnel might not recognize the need for hand hygiene after touching the environment. However, there are many studies that show bacteria can be present on these surfaces like bedside rails and can be picked up on the hands of healthcare personnel. Therefore, it is important to remember this moment for hand hygiene and clean hands after touching environmental surfaces near the patient including the over-bed table, equipment, workstations on wheels, etc., even if the surfaces look clean.



Speaker Notes: Slide 6

Hand hygiene is as important as ever given emergence of antibiotic-resistant bacteria, or in the slide here, referred to as multidrug-resistant organisms or MDROs, which are a worldwide public health threat. These MDROs can cause healthcare-associated infections – in fact in acute care facilities up to 14 percent of infections can be caused by MDROs. Most of these multidrug-resistant bacteria are easily transmitted on the hands of healthcare personnel, so hand hygiene is essential to help prevent the spread of these hard to treat bacteria.



Speaker Notes: Slide 7

Now that we have discussed the importance of effective hand hygiene, let's review when healthcare personnel should clean their hands. The World Health Organization Hand Hygiene Guidelines identified "Five Moments for Hand Hygiene" and they are pictured here. These include before touching a patient, before performing a procedure, like inserting an intravenous catheter, after direct contact with body fluid, after taking care of a patient and after touching surfaces like a bedside rail that are near the patient. Healthcare personnel should receive training on the moments for hand hygiene as well as methods of effective hand hygiene. There are additional details and posters that provide information on how and when to clean hands from both Centers for Disease Control and Prevention and the World Health Organization.



Speaker Notes: Slide 8

Since patients are at the center of all we do in healthcare, it is important to encourage them, their families, and visitors to use hand hygiene too. As a healthcare provider, therefore, it is important to encourage patients to clean their hands and provide supplies for them to clean their hands, disposable wipes and personal alcohol-based hand rub.

While patients and family are aware of the importance of hand hygiene, this is often not reinforced during inpatient care. In fact, one study found few patients recall their providers talked about hand hygiene and this same study found adherence to use of hand hygiene by patients was only about 10 percent of the times when it was indicated.



Speaker Notes: Slide 8 Continued

When providers encourage patients to clean their hands, especially prior to meals, the frequency of cleaning by the patients increased to upwards of 80 percent. The researchers who conducted this study have identified four primary moments for patient hand hygiene, these include:

1. Before or after the patient touches an invasive device, such as an intravenous catheter, or their surgical site or feeding tube
2. Before eating
3. After using the restroom or handling a bedpan and
4. When entering or leaving their room



Speaker Notes: Slide 9

We should also partner with patients and family members to encourage them to help us remember to clean our hands. Their voices are very important and it is worth sharing with your patients that we welcome their hand hygiene reminders when we are taking care of them. You can suggest that they offer statements like:

- “I didn’t see you clean your hands when you came in, would you mind cleaning them again before you examine me?” or
- “I’m worried about germs spreading in the hospital. Will you please clean your hands once more before you start my treatment?”

Now let’s learn more about methods for cleaning hands.



Speaker Notes: Slide 10

There are a number of different methods healthcare personnel can use to clean their hands. These include an alcohol-based hand rub or washing hands with soap and water. Alcohol-based hand rub can be used for most patient care – including situations when an antiseptic or antimicrobial product is recommended, for example prior to inserting an intravenous catheter or performing surgery. Soap and water is needed if hands are visibly dirty`. Handwashing can be done with regular soap or an antimicrobial soap. An antimicrobial soap is often provided in healthcare facilities for routine handwashing.



Speaker Notes: Slide 10 Continued

Hand hygiene prior to performing surgery is called surgical hand hygiene or surgical hand antisepsis and can be done with either an antimicrobial soap and water, or an alcohol-based hand rub. Both of these would have labeling that's approved for this type of application and you can look at that product and make sure it's used or appropriately approved.



Speaker Notes: Slide 11

Compared to soap and water, alcohol-based hand rub is more effective at reducing bacterial counts on the hands, it includes multidrug-resistant organisms, like methicillin-resistant *Staphylococcus aureus* or MRSA. According to laboratory efficacy testing, antimicrobial soap is effective, but as you can see here, not quite as much as hand rub. Additionally, alcohol-based hand rub or sanitizers can cause less skin irritation than frequent use of soap and water. For healthcare personnel be sure to use a rub which has a concentration of alcohol between 62 and 90 percent. Now let's learn some more about hand rub and how efficient this method can be compared to hand washing with soap and water.



Speaker Notes: Slide 12

The benefits of using alcohol-based hand rub include: it takes less time to clean your hands, is more effective against bacteria on the skin, can be more accessible than having to find a handwashing sink and actually improves skin condition as many hand rubs contain moisturizers. On the topic of skin condition, healthy skin is less likely to permit growth of microbes that may be picked up during patient care. Therefore lotions that are compatible with hand rub or soap should be provided to keep your skin moisturized. Petroleum-based lotion formulations can weaken latex gloves and increase permeability. Lotions that contain petroleum or other oil emollients should only be used at the end of the workday.



Speaker Notes: Slide 12 Continued

If using lotions during the workday, select a water-based product. At the time of product selection, information should be obtained from the manufacturer regarding interaction between gloves, lotions, dental materials, and antimicrobial products. Healthcare personnel that develop skin irritation should inform their supervisors and may need to be seen by Employee Health.



Speaker Notes: Slide 13

So you have all heard the phrase, “A picture is worth a thousand words,” and this illustration certainly brings this home. This was a study from Donskey and others that showed the concentration of MRSA detected on hands of a healthcare personnel after providing a simple abdominal exam of a patient who was colonized in the nose with MRSA. After the exam this personnel pressed his hand onto culture plate. Following incubation, the plate on the left had close to 1,000,000 to upwards of a billion bacteria. This person then applied alcohol-based hand rub and pressed their clean hand onto another culture plate – on the right side of this picture. The result of using the hand rub is almost total removal of MRSA from the hand of the healthcare personnel. This demonstrates at a glance the efficacy of this method of hand hygiene.



Speaker Notes: Slide 14

As discussed earlier it is important that healthcare personnel choose the right hand hygiene method and know when and how to perform proper hand hygiene.

For hand rub, choose an alcohol-based hand rub that is between 62 and 90 percent alcohol and apply enough hand rub to the palm of the hand to be able to cover the skin of both hands, all surfaces, and underneath fingernails. Rub hands after applying to one of the palms and then rub it into the other hand until your hands feel dry.



Speaker Notes: Slide 15

For handwashing, the key is to wet the hands and then apply soap. Work up a soap lather and scrub all surfaces of your hands including underneath the fingernails for at least 15 seconds, rinse off the soap and dry hands – being sure to turn off water with paper towel, if available. There are some myths that are commonly related to hand hygiene so let's learn about some of these and focus on the scientific facts.



Speaker Notes: Slide 16

One common misconception is that hand rub can't be used when caring for patients with certain bacteria like *Clostridioides difficile*. *Clostridioides difficile*, or "C. diff" is a spore-forming bacteria and it is true that these spores are definitely resistant to alcohol. The most important prevention step however when caring for patients with *Clostridioides difficile* infection is to put on gloves prior to or as soon as possible after entering the patient's room. The gloves lessen the chance that hands become contaminated with *Clostridioides difficile* or their spores. It is important to follow your facility's policy on hand hygiene for patients with *Clostridioides difficile* infection.



Speaker Notes: Slide 16 Continued

However, several studies have not found correlation between use of hand rub and frequency of *C. difficile* infections or outbreaks. Many facilities do support a sequence of both methods and this includes use of hand rub on the way into the room. Gloves are then put on along with other personal protective equipment. Once you complete the care of the patient, you can remove the personal protective equipment and gloves and then wash with soap and water before leaving the patient's room. If a facility has a high frequency of *C. diff.* some have policies that only soap and water can be used when caring for patients with this infection. The key is to find out what policy is established at your facility and follow it consistently.



Speaker Notes: Slide 17

Another myth is that technique is not critical, but this couldn't be further from the truth. It is important to pay attention to areas where bacteria are most likely to be present. For example, the concentration of bacteria on hands is highest underneath the fingernails – so keep those short. Other areas to focus on are the thumbs and skin between the fingers.



Speaker Notes: Slide 18

The final myth busting tips are to use enough hand hygiene product and make sure you clean your hands after removing gloves. For hand rub as we mentioned earlier, it is important to put on enough rub on your hands to cover all surfaces. After you've applied the hand rub make sure it reaches underneath the fingernails and continue to rub your hands until it dries. If your hands are dry after rubbing for only a few seconds you probably did not put enough hand rub into your hands. For soap and water – we want to apply enough soap and work up a lather and scrub for at least 15 seconds, rinse and then dry your hands.



Speaker Notes: Slide 18 Continued

Gloves let you remove bacteria and other soil when you take them off, however it is still important to clean your hands after you take them off. Gloves may develop small openings during use, and during removal it can be easy to contaminate your bare hands, so hand hygiene is important after removal of gloves.

Lastly, it is also important to follow instructions for use for commercially available products. These instructions may contain additional directions or warnings unique to that particular product. These instructions should be incorporated into facility hand hygiene and glove use policies.



Speaker Notes: Slide 19

No notes.



Speaker Notes: Slide 20

No notes.

