CDC and WHO Guidelines and How They Relate to Long Term Care Facilities

John M. Boyce, MD
J.M. Boyce Consulting, LLC
Middletown, CT

Disclosure: JMB is a consultant to, has received travel support from, and has been a speaker at conferences supported by Diversey and GOJO industries

• Background
  • Timeline of CDC and World Health Organization (WHO) guidelines

• Compare CDC and World Health Organization guidelines
  • CDC recommendations on when to perform hand hygiene
  • Comparison of recommendations by CDC and WHO Guidelines
  • What’s different in 2014 SHEA Compendium on hand hygiene
  • 2019 CDC training course recommendations for hand hygiene in nursing homes

• Evidence supporting the use of ABHRs as the preferred method of hand hygiene
  • Less time-consuming
  • Antimicrobial efficacy
  • Less irritating and drying than soap and water handwashing

• Recommended methods for applying ABHRs to hands
  • Amount to apply
  • Cover all surfaces of hands/fingers
  • How long should you rub your hands together?

• What are the WHO’s “5 Moments for Hand Hygiene”
  • Describe 5 Moments
  • Explain Patient Zone
  • How do the 5 Moments relate to LTCFs

• Summary
Major recommendations:
- Alcohol-based hand rub (ABHR) was recommended as the preferred form of hand hygiene if hands are not visibly soiled.
- Indications for when to wash with soap and water were included.
- Educate healthcare workers (HCWs) regarding the advantages of ABHRs.
- Monitor hand hygiene compliance of HCWs and provide them with feedback on their performance.

Recommendations are for acute care and LTCFs
- No specific recommendations for LTCFs.

Wash hands with a non-antimicrobial soap and water or with an antimicrobial soap and water:
- When hands are visibly dirty or contaminated with proteinaceous material, or are visibly soiled with blood or other body fluids (IA).
- Before eating (IB).
- After using a restroom (IB).
- If exposure to Bacillus anthracis is suspected or proven (II).

If hands are not visibly soiled, use an alcohol-based hand rub for routinely decontaminating hands:
- Before contact with the patient and before performing aseptic procedures (e.g., starting IV, inserting Foley catheter).
- After contact with a patient’s intact skin (IB).
- After contact with body fluids or excretions, mucous membranes, non-intact skin and wound dressings (IA).
- If moving from a contaminated body site to a clean body site during patient care (II).
- After contact with inanimate objects (including medical equipment) in the immediate vicinity of the patient (II).
- After removing gloves (IB).
2009 WHO Guidelines on Hand Hygiene in Health Care

- Developed by > 100 international experts
- General recommendations
  - None specific for LTCFs
- Indications for hand hygiene are very similar to those in CDC guideline

https://www.who.int/gpsc/5May/en

Comparison of CDC and WHO Hand Hygiene Guidelines

<table>
<thead>
<tr>
<th>Task with either an antiseptic or an antimicrobial soap and water</th>
<th>CDC guideline</th>
<th>WHO-2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wash hands after contact with bodily fluids or clean contaminated</td>
<td>Y (1)</td>
<td>Y (8)</td>
</tr>
<tr>
<td>Perform hand hygiene with alcohol-based hand rub (ABHR) before</td>
<td>Y (3)</td>
<td>Y (2)</td>
</tr>
<tr>
<td>Donning gloves or donning of PPE</td>
<td>Y (4)</td>
<td>Y (1)</td>
</tr>
<tr>
<td>Donning PPE or goggles</td>
<td>Y (5)</td>
<td>Y (2)</td>
</tr>
<tr>
<td>Performing aseptic technique</td>
<td>Y (6)</td>
<td>Y (2)</td>
</tr>
<tr>
<td>Removing protective clothing</td>
<td>Y (7)</td>
<td>Y (3)</td>
</tr>
<tr>
<td>Decontamination of hands with alcohol-based hand rub (ABHR) or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>antiseptic foam before contact with healthcare workers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Donning sterile gloves before lidocaine infiltration</td>
<td>Y (9)</td>
<td>Y (1)</td>
</tr>
<tr>
<td>Before and after intubation</td>
<td>Y (10)</td>
<td>Y (2)</td>
</tr>
<tr>
<td>Before and after tracheostomy</td>
<td>Y (11)</td>
<td>Y (2)</td>
</tr>
</tbody>
</table>

Ellingson K et al. Infect Control Hosp Epidemiol 2014;35:937 (SHEA Compendium)

2014 SHEA Practice Recommendation on Hand Hygiene

- SHEA document was designed to:
  - Present a more concise (shorter) format than CDC and WHO
  - Update the evidence base supporting recommendations
  - Identify issues that require clarification or greater research
- Differences between CDC, WHO and SHEA documents
  - SHEA agrees with WHO that either non-antimicrobial soap or antimicrobial soap can be used for handwashing (unlike CDC)
  - Both SHEA and WHO recommend hand hygiene before preparing or handling medication during patient care (not in CDC guideline)
  - SHEA document recommends monitoring hand hygiene using:
    - Direct observation
    - Product volume measurement (e.g. number of items of ABHR used/100 resident yrs)
    - Automated monitoring system (not in CDC or WHO guidelines)

Ellingson K et al. Infect Control Hosp Epidemiol 2014;35:937
2014 SHEA Practice Recommendation on Hand Hygiene

- Differences between CDC, WHO and SHEA documents
  - Unlike CDC and WHO, SHEA recommends
  - Consider preferential use of soap & water handwashing during norovirus outbreaks
    - Based on evidence that some ABHR formulations have reasonable activity against norovirus (hence use of such products on cruise ships)
  - During C. difficile outbreaks or settings with hyperendemic C. difficile, consider preferential use of soap & water handwashing after caring for patients with known or suspected C. difficile infection
    - Wearing gloves is the primary form of hand hygiene when caring for residents with C. difficile infection
  - Do not use triclosan-containing soap (unlike CDC and WHO)

Ellingson K et al. Infect Control Hosp Epidemiol 2014;35:937

Evidence Supporting the Use of ABHRs as the Preferred Method of Hand Hygiene

- Time required for soap & water handwashing:
  - 62 seconds to get to sink, wash, dry and return
  - ICU with 12 nurses
    - 40% compliance: 2 to 6.4 hrs/8-hr shift
    - 100% compliance: 16 hrs/shift

- Time required for alcoholic hand disinfection:
  - 15-second contact time - bedside dispenser
    - 40% compliance: 1 to 1.6 hrs/8-hr shift
    - 100% compliance: 4 hrs/shift

Voss A & Widmer AF Infect Control Hosp Epidemiol 1997;18:205-8

Attitudes of Healthcare Workers in the United States about Alcohol Hand Rubs

- A few countries in Europe and Scandinavia were using alcohol-based hand rubs (ABHRs) for hand hygiene in the 1980s and 1990s

- However, in the U.S., there was a widespread belief among healthcare workers that: “alcohol will dry out my hands”
Relative Efficacy of Hand Hygiene Agents

<table>
<thead>
<tr>
<th>Year</th>
<th>Least Effective</th>
<th>Most Effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978</td>
<td>JMBoyce</td>
<td></td>
</tr>
</tbody>
</table>

Contamination of HCW Bare Hand After Touching Patient Colonized with MRSA

Before Hand Hygiene | After Use of Alcohol Hand Rub

Efficacy of Soap & Water Handwashing vs Alcohol-Based Handrub in Reducing Pathogens on the Hands of LTCF Personnel

Mody L et al. Infect Control Hosp Epidemiol 2003;24:165

Irritant Contact Dermatitis Due to Frequent Handwashing

- Frequent use of soap & water can lead to skin irritation and damage due to irritant contact dermatitis
  - Painful skin irritation causes healthcare personnel to avoid handwashing
  - May lead to increased colonization of hands by pathogens

Alcohol-Based Hand Rubs Cause Less Skin Irritation and Dryness than Soap & Water Handwashing

- In 1998, a 6-week prospective randomized trial with crossover design
  - Funded by GOJO Industries
- 29 nurses on 3 wards participated
- The study compared:
  - A non-medicated, “mild” soap
  - An alcohol hand gel

Skin irritation/dryness of nurses' hands were assessed:
  - Self-assessment by participants
  - Visual assessment by study nurse
  - Measuring electrical capacitance of skin on hands

Average Electrical Capacitance Readings of the Skin of Nurses' Hands

Note: Low Corneometer reading indicates dry skin


HAND-HYGIENE COMPLIANCE DURING 7 HOSPITAL‐WIDE SURVEYS, UNIVERSITY OF GENEVA HOSPITALS, 1994‐97


Prevalence of Nosocomial Infections and Incidence of MRSA, University of Geneva Hospitals, 1993‐98

**CDC and WHO Hand Hygiene Guidelines**

- CDC and WHO guidelines and SHEA Compendium all recommend the use of alcohol-based hand rubs (ABHRs) for routine hand hygiene

- **ABHRs:**
  - Faster to use and more convenient
  - Are more effective than soap & water handwashing at reducing bacteria on hands
  - Cause less skin irritation and dryness than handwashing
  - Can promote increased hand hygiene compliance and reduction of healthcare-associated infections

- CDC Guideline for Hand Hygiene in Healthcare Settings 2002
- WHO Guidelines for Hand Hygiene in Health Care 2009
- SHEA Compendium on Hand Hygiene 2014

---

**How Much ABHR Should You Apply to Your Hands?**

- To achieve rapid drying of ABHR, some healthcare personnel may apply < 1 ml of product to their hands

- Applying small amounts of ABHR to hands:
  - Does not allow ABHR to cover all surfaces of hands and fingers
  - Especially true for personnel with large hands
  - Does not result in adequate reduction of bacteria on hands

- Facilities should set ABHR dispensers to deliver 1.1 - 2 ml/dose

---

**Relationship Between ABHR Dry-Time and Antimicrobial Efficacy**

- Controlled Laboratory study using modified EN 1500 method
  - 1, 2, 3 ml of n-propanol were applied to hands
  - Dry-time, hand size and log10 reductions were recorded

- Results:
  - Significant correlation between dry-time and log10 reduction ($p < 0.0001$). Dry time was the primary factor affecting antimicrobial efficacy

- Conclusion:
  - Applying < 1 ml of ABHR that dries quickly is not efficacious

Suchomel M et al. Antimicrob Resist Infect Control 2018;7:65

---

Macinga DR et al. Infect Control Hosp Epidemiol 2013;34:299
Macinga DR et al. BMC Infect Dis 2014;14:111
Suchomel M et al. Antimicrob Resist Infect Control 2018;7:65

---

8
How Long Should Hands Be Rubbed Together with ABHR?

- Personnel often rub their hands together with ABHR for <10 seconds
- Amount of time hands are rubbed together with ABHR “drying time” is primary factor affecting antimicrobial efficacy
  - Similar to “contact time” with surface disinfectants
- WHO recommends rubbing hands together for 20-30 seconds
- Pires et al. found that 15 seconds was as effective as 30 seconds
- With most products, hands need to be rubbed together for 15-30 seconds before they feel dry in order to achieve adequate reduction of bacteria
  - If hands feel dry after rubbing for <10 seconds, too little ABHR was applied

Hand Hygiene Technique

- WHO guidelines recommended that hands be rubbed together for 20-30 seconds
- Subsequent study by Pires et al. found that rubbing for 15 seconds was as effective as 30 seconds
- WHO recommends 6-steps after applying ABHR to hands

Areas often missed during hand hygiene

Simplified Hand Hygiene Technique
Should Healthcare Personnel Wash Their Hands with Soap & Water After Several Uses of Alcohol-Based Hand Rub?

- CDC training course on hand hygiene in long-term care settings states:
  - Not necessary to wash hands with soap & water after several uses of an alcohol-based hand rub
  - Some personnel may choose to wash with soap & water if they feel a build-up of residue after several applications
  - Frequent switching between alcohol-based hand rub and handwashing may increase the risk of irritant dermatitis

What About Using Pocket Bottles of ABHR?

- No evidence that bacteria on the outside of the pocket bottle is responsible for transmission of healthcare-associated pathogens
- Providing pocket bottles of ABHR may increase compliance in areas of a facility where wall-mounted dispensers are not accessible

Placement of ABHR in LTCFs

Hand Hygiene Product Accessibility

Factors to consider for hand hygiene product placement:
- Place in resident care areas and other locations.
- Provide ABHR in places where sinks cannot be added.
- Consider dispenser accessibility in multi-resident rooms.
- Obtain staff input on the accessibility of hand hygiene dispenser locations.

Source: CDC Training course on hand hygiene in long-term care settings
https://www.train.org/cdctrain/training_plan/3814
Impact of Hand Hygiene on Reducing Infections in Nursing Home Residents

- Prospective hand hygiene improvement program in 174-bed LTCF

- Program elements included:
  - Switch from soap & water handwashing to use of ABHRs
  - Increased product availability
  - Education of HCP and residents
  - Observation tool to monitor hand hygiene compliance
  - Included videos on hand hygiene technique

- Results: Reduction in LRTIs and slight reduction in SSTIs


Cluster-Randomized Hand Hygiene Intervention Trial

- Prospective cluster-randomized hand hygiene intervention trial in 26 nursing homes for 1 year

- Intervention in 13 nursing homes included:
  - Increased availability of ABHR
  - Hand hygiene promotion
  - Staff education
  - Local work groups

- Results:
  - Intervention group had
    - Significantly increased use of ABHR
    - Significantly lower mortality
    - Significantly less antibiotic use
  - Data on infection rates was of insufficient quality for analysis

- Further studies of the impact of hand hygiene promotion on infections in LTCFs are needed


WHO My 5 Moments for Hand Hygiene

- WHO guideline introduced concept of 5 Moments for Hand Hygiene
  - Patient Zone
  - Healthcare Area

- Designed to assist in educating personnel regarding the indications for hand hygiene

- Framework for monitoring hand hygiene compliance

WHO Hand Hygiene in Outpatient and Home-based Care and Long-term Care Facilities

• Guideline explains how the 5 Moments for Hand Hygiene and the concepts of the Patient Zone and Healthcare Zone relate to LTCF settings

• Guideline presents several specific examples of when hand hygiene is indicated in caring for LTCF residents
  • Obtaining vital signs and performing finger-stick
  • Changing an incontinent brief or product
  • Physiotherapy and mobility exercise care

Health-Care Area

• Health-care area includes
  All surfaces outside patient zone (i.e., other patients surfaces in hallways surfaces in nursing station equipment not dedicated to one patient [moved in and out of patient zones])
Patient Zone

- Patient zone includes:
  - the patient or resident
  - and some surfaces/items in his/her surroundings that are temporarily and exclusively dedicated to him/her (i.e., all inanimate surfaces, including the patient’s personal belongings, touched by or in direct physical contact with the patient and touched by the HCW during patient care)
  - NOT items moved from one patient to another, in and out of the patient zone

Examples of items in patient zone:
- Resident’s bed and bed sheets
- Bedside table
- Fixed telephone in resident’s room
- IV Infusion pump at bedside
- Cardiac monitor
- Indwelling urinary catheter

Recent study found that not all healthcare personnel interpret the Patient Zone the same way
- Misinterpretations included considering objects that move from the Healthcare Area into the Patient Zone as part of the Patient Zone


Example of Applying 5 Moments for Hand Hygiene in LTCF

Nurse enters resident’s room with supplies for changing a dressing on a pressure ulcer. Nurse helps position resident in bed. She then puts on gloves, opens wound dressing kit, removes the old wound dressing, and applies a new dressing. Then she removes gloves and leaves resident’s room

- How many times should the nurse have performed hand hygiene?
Nurse enters resident’s room with supplies for changing a dressing on a decubitus ulcer. Nurse helps position resident in bed. She then puts on gloves and removes the old wound dressing and applies a new dressing. Then she removes gloves and leaves resident’s room.

Answer: 3 times
- Upon entering the patient zone and before touching resident (Moment 1)
- Before donning gloves to perform an aseptic procedure (wound dressing change) (Moment 2)
- After removing gloves (Moments 3 and 4 combined)

Examples of Temporary Patient Zones


2019 CDC Training Course Agrees with Concept of WHO 5 Moments

When to Perform Hand Hygiene

- Hand hygiene indications identify the points in time when hand hygiene should be performed.
- The World Health Organization (WHO) defines indications as “moments.”

For more information, visit the WHO website on the SAFE LIVES: Clean Your Hands campaign.

Source: CDC Training course on hand hygiene in long-term care settings
https://www.train.org/cdctrain/training_plan/3814
Summary

• Indications for hand hygiene are nearly the same in the CDC and WHO Hand Hygiene Guidelines.

• Both evidence-based guidelines recommend that ABHRs be the preferred method of hand hygiene, if hands are not visibly soiled.

• Make ABHRs readily available to HCP at/near the point of care.

• Apply at least 1 ml of ABHR to hands and rub together for a minimum of 15 seconds, covering all surfaces of hands/fingers.

• Use the WHO 5 Moments for Hand Hygiene to guide when hand hygiene should be performed.
  > Also recommended in CDC Training Course for Infection Control in Nursing Homes.

Thank you for your attention!

CDC Recommendations for Enhanced Barrier Precautions When Caring for NH Residents with MDROs*

• Enhanced barrier precautions refers to use of gloves & gowns during high-contact resident care activities.

  • Dressing
  • Bathing/showering
  • Transferring
  • Providing hygiene
  • Changing linens
  • Changing briefs or assisting with toileting
  • Device care or use
    > Central line, urinary catheter, feeding tube, tracheostomy/ventilator
  • Wound care
    > Any skin opening requiring a dressing

* Does not include Clostridioides difficile or norovirus.

CDC Recommendations for Enhanced Barrier Precautions
When Caring for NH Residents with MDROs*

- Place sign on door or wall outside resident's room
  - Include list of high-contact activities
- Make gowns and gloves available outside resident's room
- Ensure access to alcohol-based hand rub in every resident room
  - Ideally, both inside and outside room
- Perform periodic monitoring and assessment of adherence to
determine need for training and education
- Provide education to residents and visitors

* Does not include Clostridioides difficile or norovirus


Is Ingestion of ABHR a Problem in LTCFs?

- Ingestion of ABHR has been reported, but rarely
- A number of cases have been reported in young children
- Examples of isolated reported cases in adults:
  - 81 y/o hospitalized patient in Germany – suicide attempt
  - 38 y/o hospital patient in France with history of personality disorder
    and previous alcohol abuse – suicide attempt
  - 38 y/o hospital patient in U.K. with ongoing history of alcohol abuse
  - 46 y/o patient in US with history of bipolar disease and alcohol abuse
  - 43 y/o hospital patient in US with history of alcoholism
  - 27 y/o patient in US with history of polysubstance abuse
  - 53 y/o hospital patient in US with alcoholism

- Reported cases in LTCF residents appear to be uncommon