

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

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

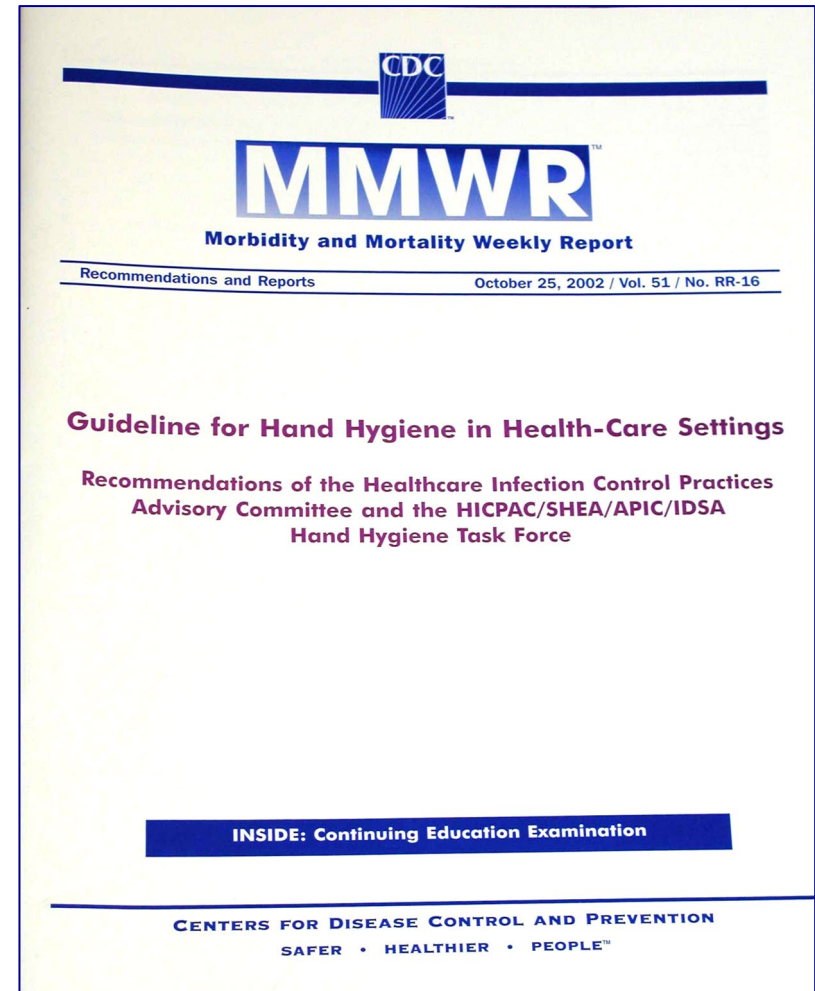
- **Background**
 - Timeline of CDC and World Health Organization (WHO) guidelines
- **Compare CDC and World Health Organization guidelines**
 - CDC recommendations on when to perform hand hygiene
 - Comparison of recommendations by CDC and WHO Guidelines
 - What's different in 2014 SHEA Compendium on hand hygiene
 - 2019 CDC training course recommendations for hand hygiene in nursing homes

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

- **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**

CDC Guideline for Hand Hygiene in Health-Care Settings

- **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



2002 CDC Guideline for Hand Hygiene in Healthcare Settings

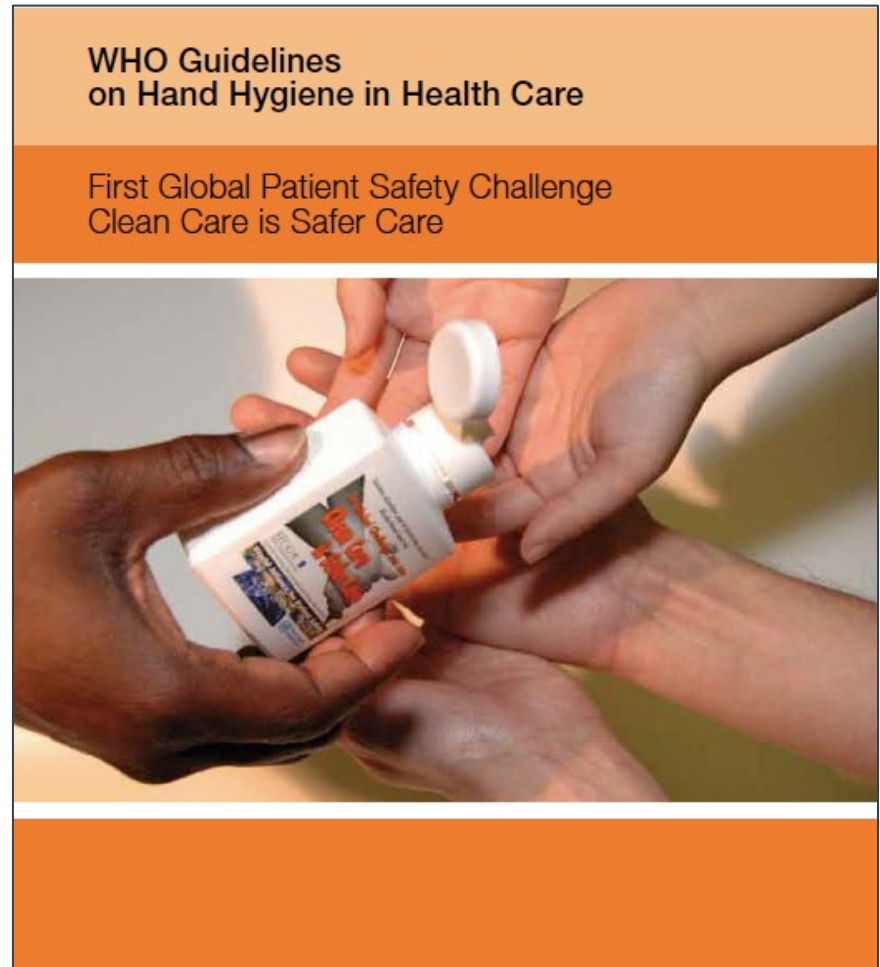
- **Recommendations are for acute care and LTCFs**
 - No specific recommendations for LTCFs
- **Wash hands with a non-antimicrobial soap and water or with an antimicrobial soap and water:**
 - When hands are visibly dirty or contaminated with proteinaceous material, or are visibly soiled with blood or other body fluids (IA)
 - Before eating (IB)
 - After using a restroom (IB)
 - If exposure to *Bacillus anthracis* is suspected or proven (II)

2002 CDC Guideline for Hand Hygiene in Healthcare Settings

- If hands are not visibly soiled, use an alcohol-based hand rub for routinely decontaminating hands
- Alternatively, wash hands with an antimicrobial soap
 - 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**



Comparison of CDC and WHO Hand Hygiene Guidelines

TABLE 1. Summary of Recommended Indications for Routine (ie, Excluding Surgical Prep) Hand Hygiene from the Centers for Disease Control and Prevention (CDC) Guidelines and the 2009 World Health Organization (WHO) Guidelines on Hand Hygiene in Health Care

	CDC guidelines ^{a,b}	WHO (2009) ^b
Wash hands with either nonantimicrobial or antimicrobial soap and water in the following clinical care situations		
When hands are visibly soiled	Y (IA), HH-2002	Y (IB)
After known or suspected exposure to <i>Clostridium difficile</i>	Y (II), ISO-2007	Y (IB, during outbreaks)
After known or suspected exposure to patients with infectious diarrhea during norovirus outbreaks	Y (II), NV-2011	ND
If exposure to <i>Bacillus anthracis</i> is suspected or proven	Y (II) HH-2002	Y (IB, spore-forming organisms)
Decontaminate hands with alcohol-based hand rub (preferentially) or <u>* soap and water (alternatively)</u> in the following situations		
Before direct patient contact	Y (IB), HH-2002	Y (IB)
Before handling medication	ND	Y (IB)
Before donning sterile gloves to insert an invasive device	Y (IB), HH-2002	Y (IB, before handling)
Before and after handling respiratory devices, urinary catheters, and intravascular catheters (palpating, replacing, accessing, repairing, or dressing)	Y (IA), PNEU-2003 Y (IB), CAUTI-2009 Y (IB), BSI-2011	Y (IB, before handling)
After direct patient contact	Y (IB), HH-2002	Y (IB)
After removing gloves	Y (IB), HH-2002	Y (IB)
After contact with blood, body fluids, mucous membranes, nonintact skin, and wound dressings if hands not visibly soiled	Y (IA), HH-2002 Y (1A), PNEU-2003	Y (IA)
After contact with inanimate objects in the patients' immediate environment	Y (II), HH-2002	Y (IB)
If moving from a contaminated body site to a clean body site	Y (II)	Y (IB)

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 liters of ABHR used/100 resident yrs)
 - Automated monitoring system (not in CDC or WHO guidelines)

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 evidence that some ABHR formulations have reasonable activity against norovirus (hence the 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)

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

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

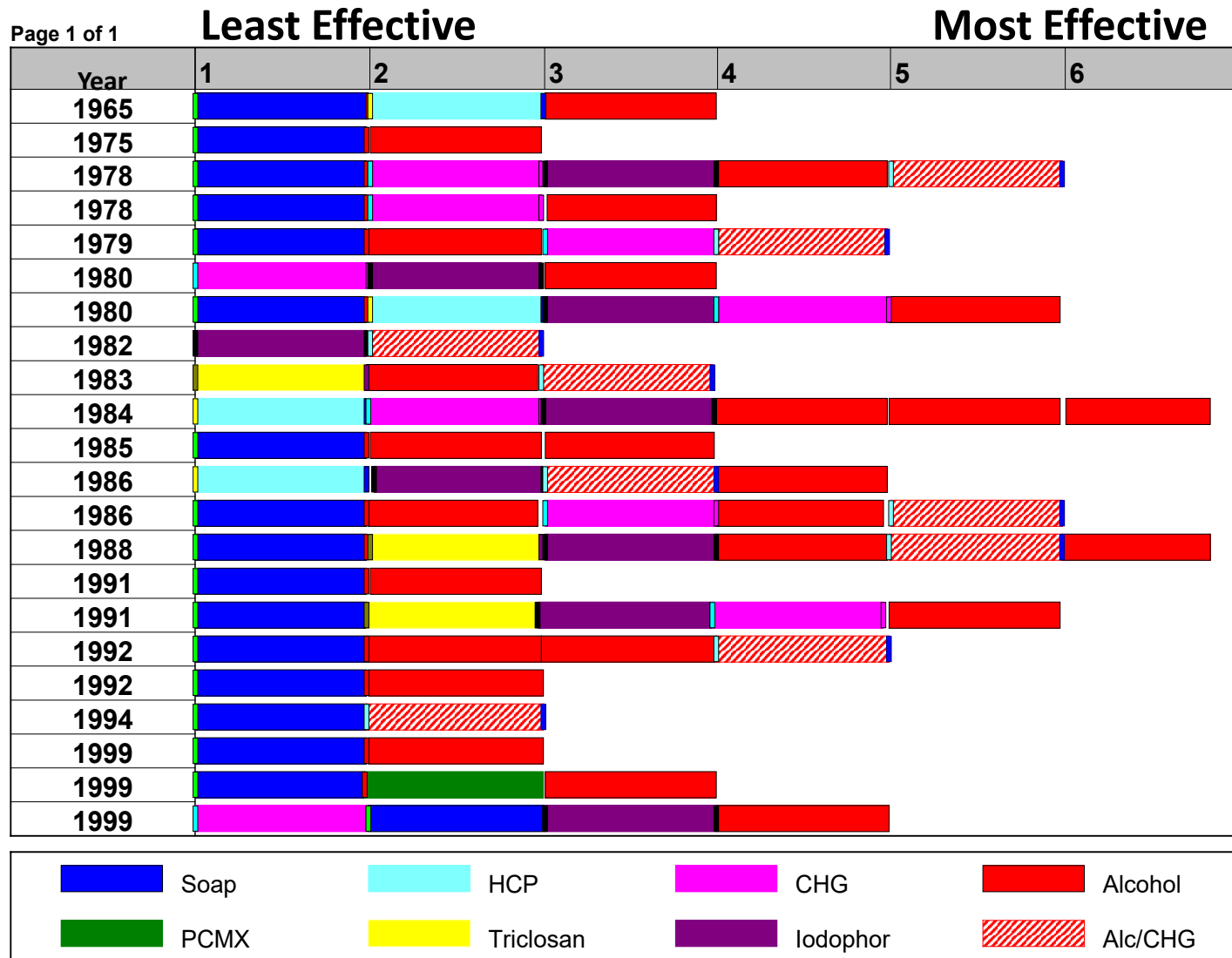
- A few countries in Europe and Scandinavia were using alcohol-based hand rubs (ABHRs) for hand hygiene in the 1980s and 1990s
- However, in the U.S., there was a widespread belief among healthcare workers that : “alcohol will dry out my hands”



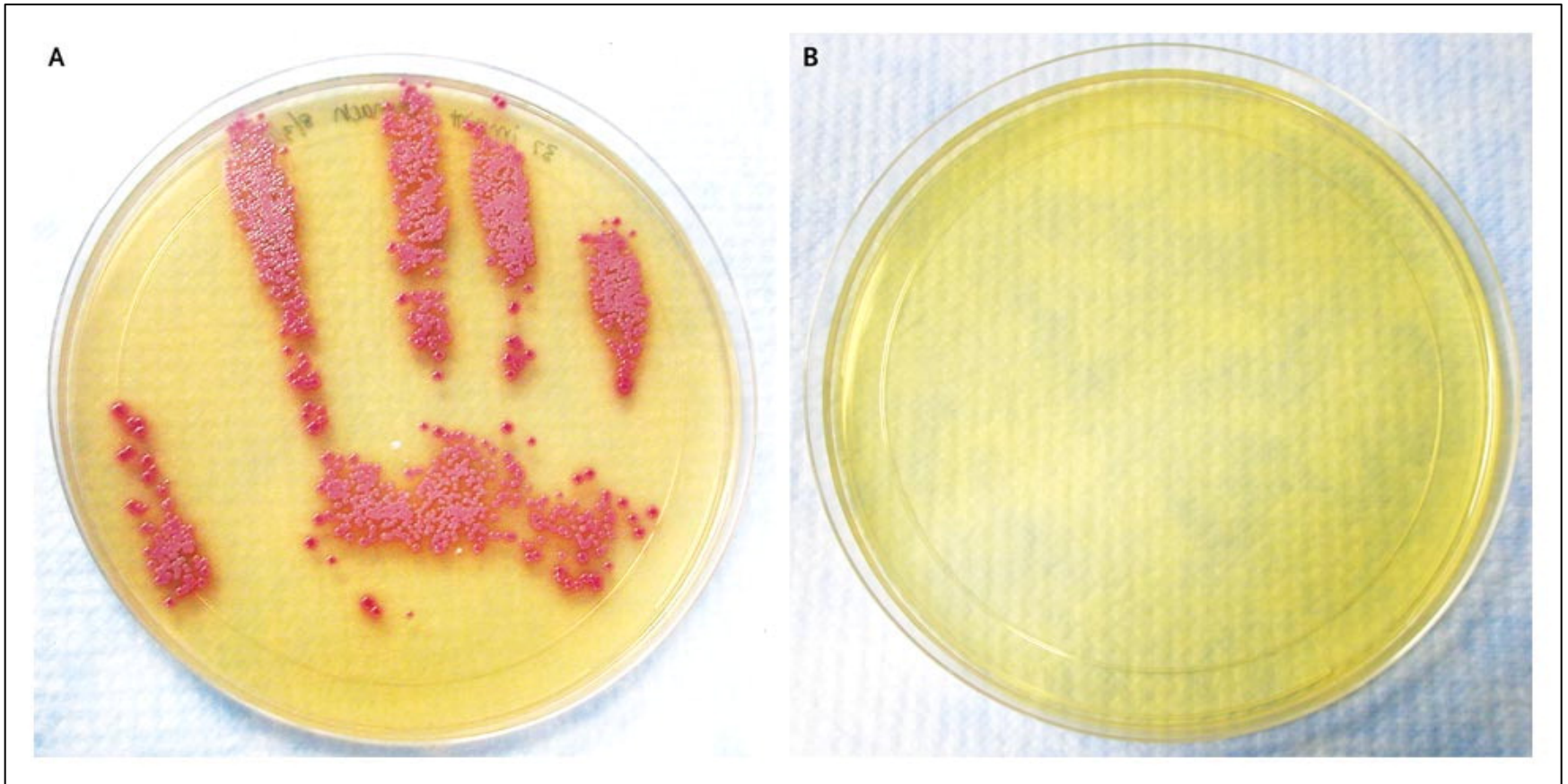
A man in a dark suit and tie is being restrained by a police officer in a dark uniform. The officer is holding the man's arm, and the man is looking towards the camera with a concerned expression. They are in a wooded area with trees and foliage in the background. The scene is dimly lit, suggesting it might be nighttime or in a shaded area. The text "Get up. Stick your hands out!" is overlaid at the bottom of the image in a yellow, bold font.

Get up. Stick your hands out!

Relative Efficacy of Hand Hygiene Agents



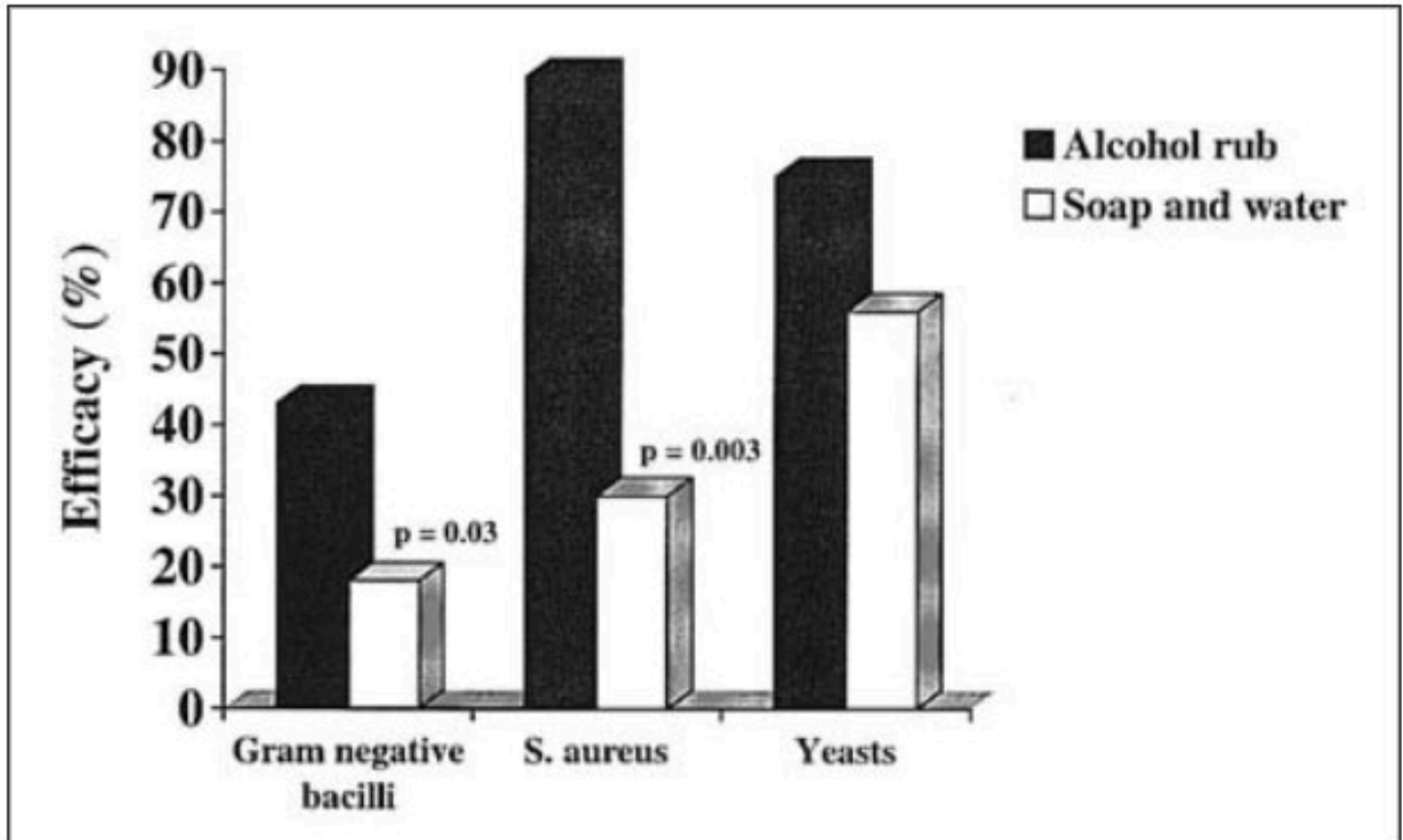
Contamination of HCW Bare Hand After Touching Patient Colonized with MRSA



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



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

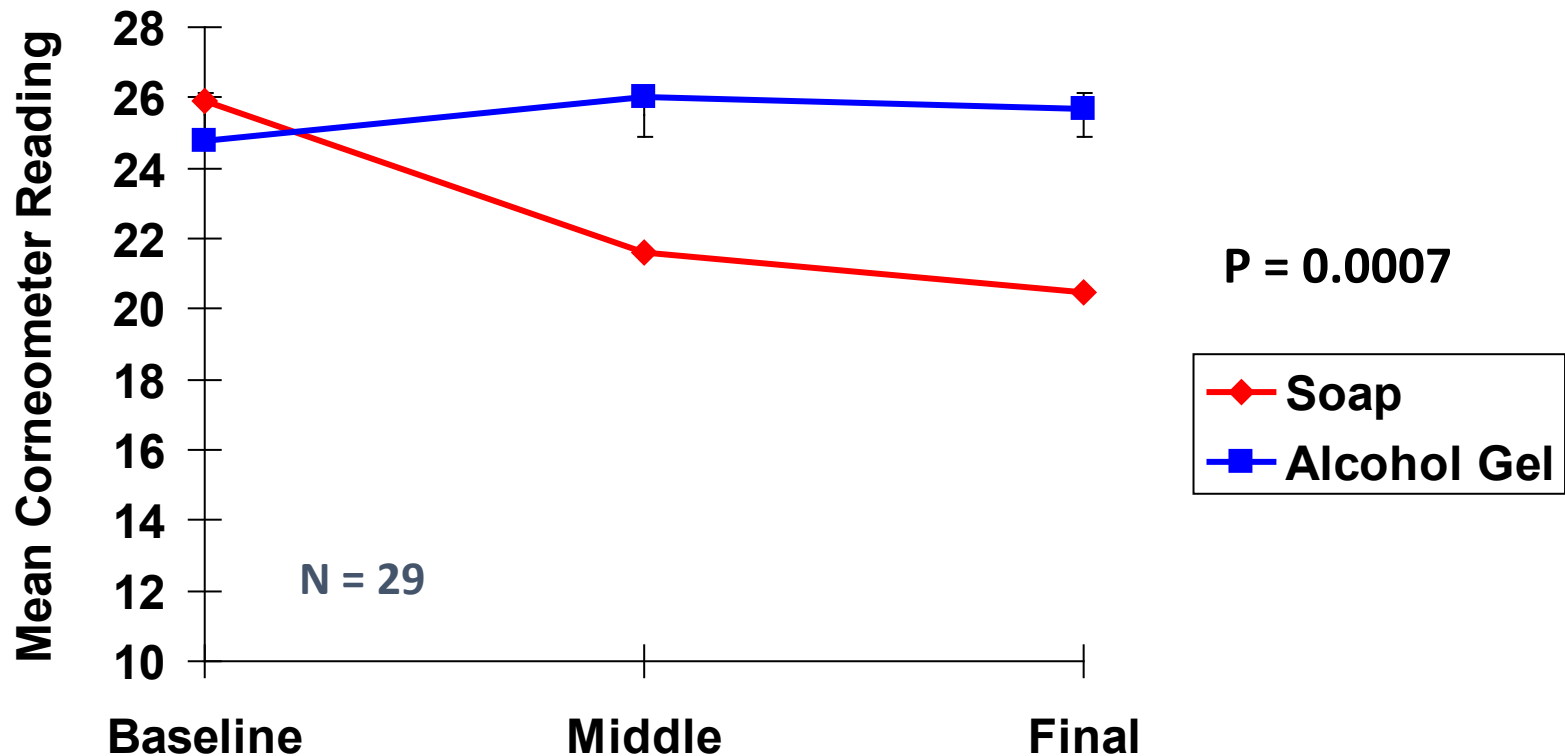


Alcohol-Based Hand Rubs Cause Less Skin Irritation and Dryness than Soap & Water Handwashing

- 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

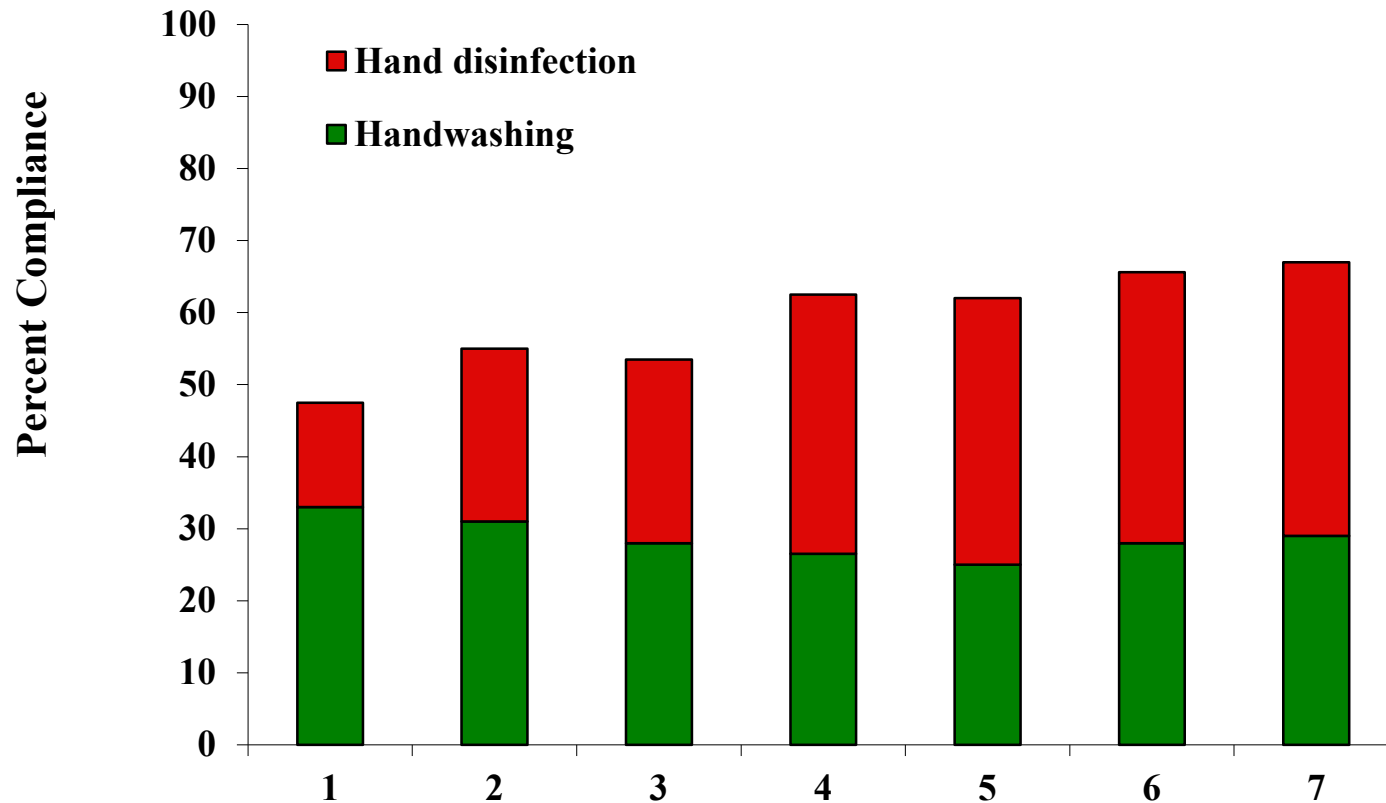


Average Electrical Capacitance Readings of the Skin of Nurses' Hands



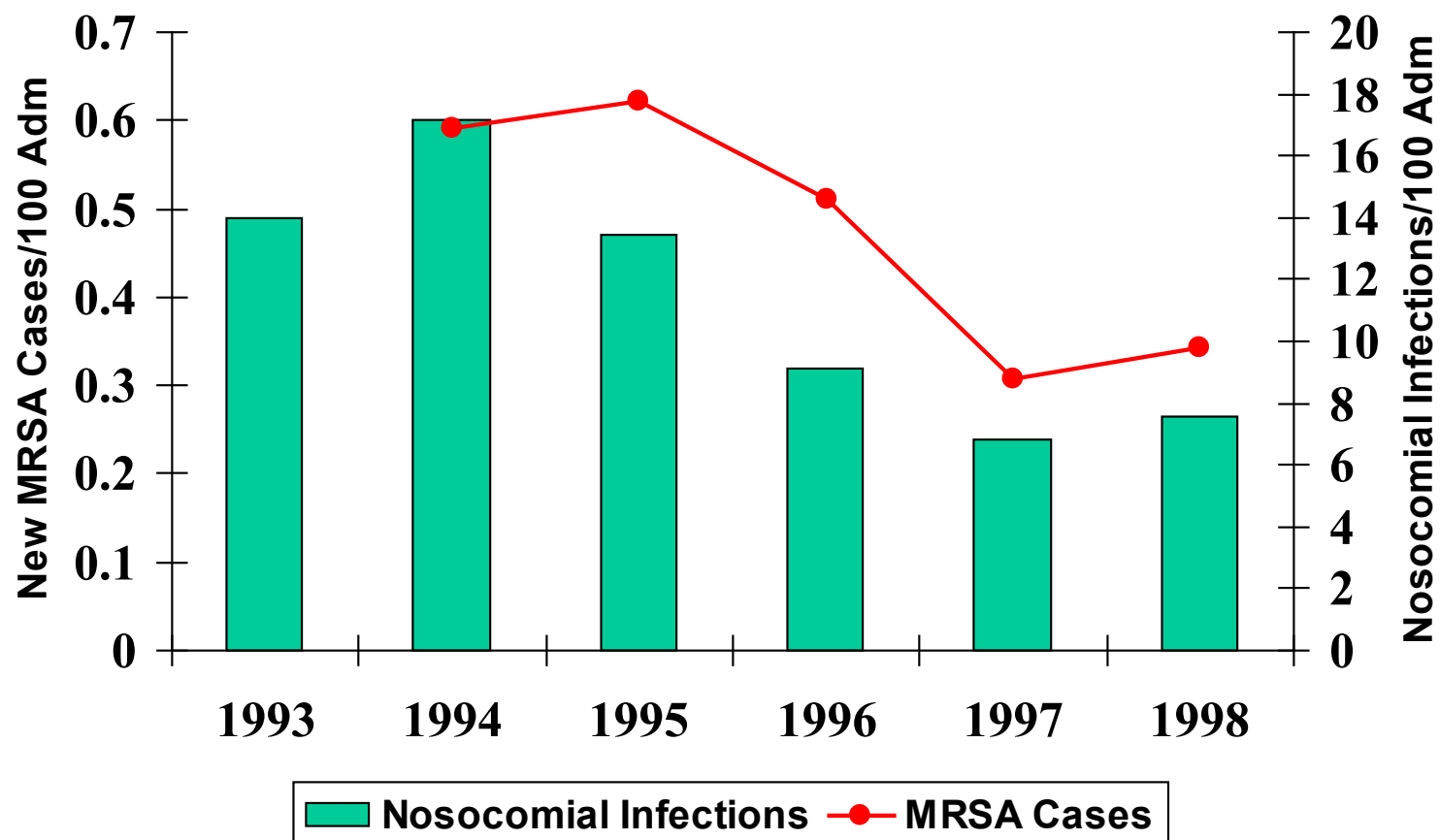
Note: Low Corneometer reading indicates dry skin

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



Pittet D et al. Lancet 2000;356:1307

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

Zingg W et al. Am J Infect Control 2016;44:1689

Macinga DR et al. Infect Control Hosp Epidemiol 2013;34:299

Macinga DR et al. BMC Infect Dis 2014;14:511

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

Relationship Between ABHR Dry-Time and Antimicrobial Efficacy

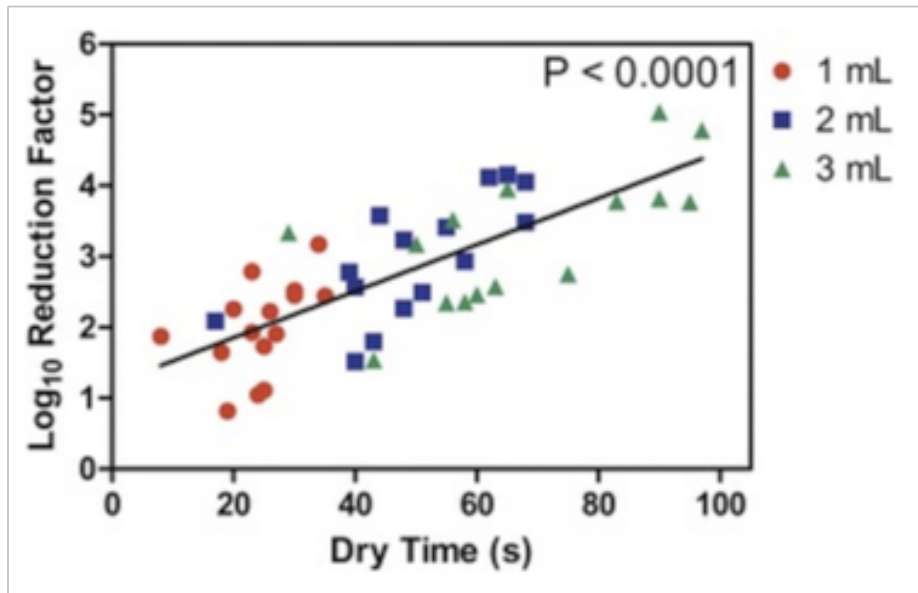
- Controlled Laboratory study using modified EN 1500 method
 - 1, 2, 3 ml of n-propanol were applied to hands
 - Dry-time, hand size and \log_{10} reductions were recorded

Results

- Significant correlation between dry-time and \log_{10} reduction ($p < 0.0001$) was the primary factor affecting antimicrobial efficacy

Conclusion

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



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 15-30 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

Helder OK et al. Int J Nurs Studies 2010;47:1245

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

WHO Guidelines on Hand Hygiene in Health Care, 2009

Pires D et al. Infect Control Hosp Epidemiol 2017;38:547

Hand Hygiene Technique

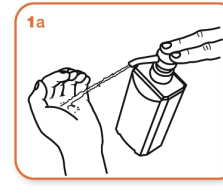
- WHO guidelines recommended that hands be rubbed together for 20-30 seconds
- Subsequent study by Pires et al. found that rubbing for 15 seconds was as effective as 30 seconds
- WHO recommends 6-steps after applying ABHR to hands →

How to handrub?

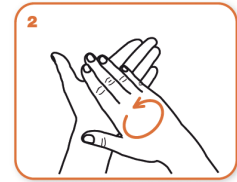
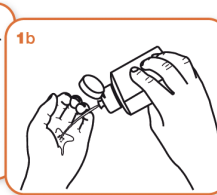
RUB HANDS FOR HAND HYGIENE! WASH HANDS ONLY WHEN VISIBLY SOILED!



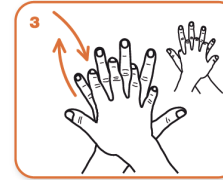
Duration of the entire procedure: 20-30 sec.



Apply a palmful of the product in a cupped hand and cover all surfaces.



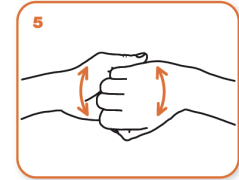
Rub hands palm to palm



right palm over left dorsum with interlaced fingers and vice versa



palm to palm with fingers interlaced



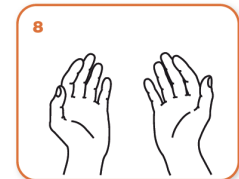
backs of fingers to opposing palms with fingers interlocked



rotational rubbing of left thumb clasped in right palm and vice versa



rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa



...once dry, your hands are safe.

WHO Guidelines on Hand Hygiene in Health Care, 2009
Pires D et al. Infect Control Hosp Epidemiol 2017;38:547



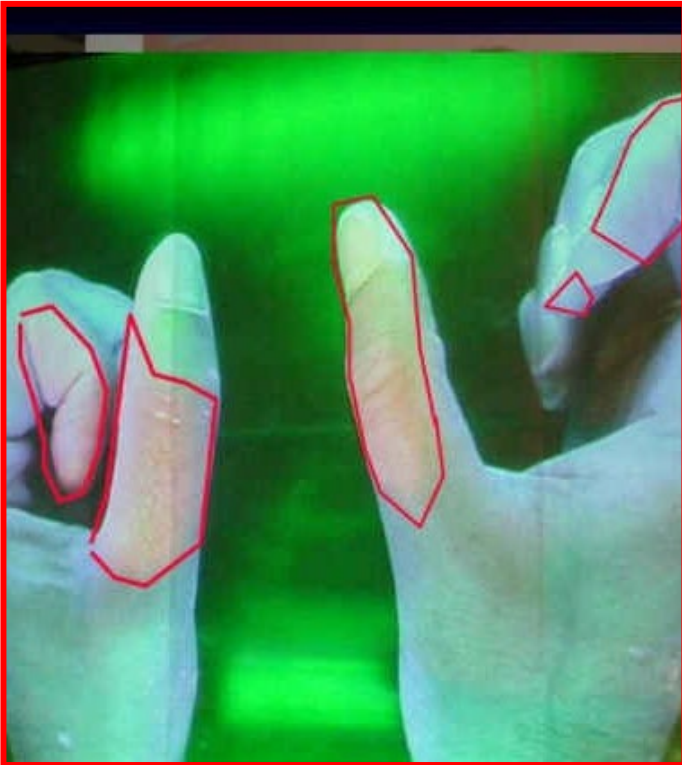
WHO acknowledges the Hôpitaux Universitaires de Genève (HUG), in particular the members of the Infection Control Programme, for their active participation in developing this material.



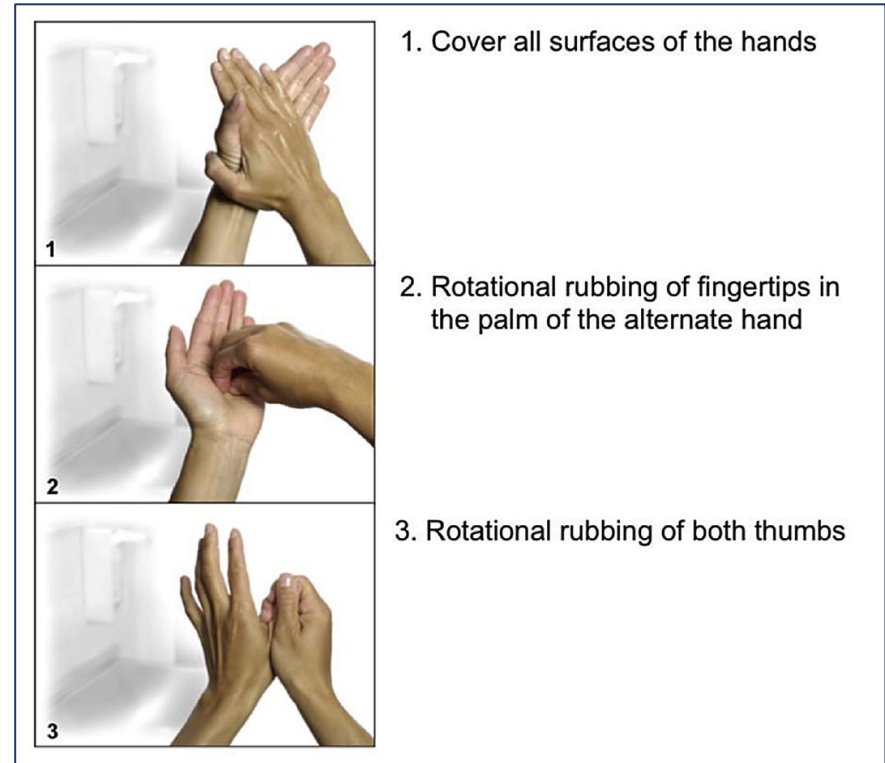
October 2006, version 1.

Hand Hygiene Technique

- Personnel seldom complete WHO 6-step procedure for hand hygiene
- Simplified 3-step procedure is faster, and may increase compliance



Areas often missed during hand hygiene



Simplified Hand Hygiene Technique

Widmer A et al. Infect Control Hosp Epidemiol 2004;25:207

Tschudin-Sutter S et al. Infect Control Hosp Epidemiol 2015;36:482

Tschudin-Sutter S et al. Clin Infect Dis 2018 [Epub ahead of print]

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

Train staff on the proper handling of pocket dispensers.



Pull the ABHR container out of the pocket and dispense an adequate gel or foam onto one hand.



Place container back in pocket with other hand before performing hand rub.



Perform hand rub, thoroughly coating all surfaces of both hands.



Go directly to the resident without touching anything or placing hands in pockets.

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

Placement of ABHR in LTCFs

Hand Hygiene Product Accessibility

Factors to consider for hand hygiene product placement:

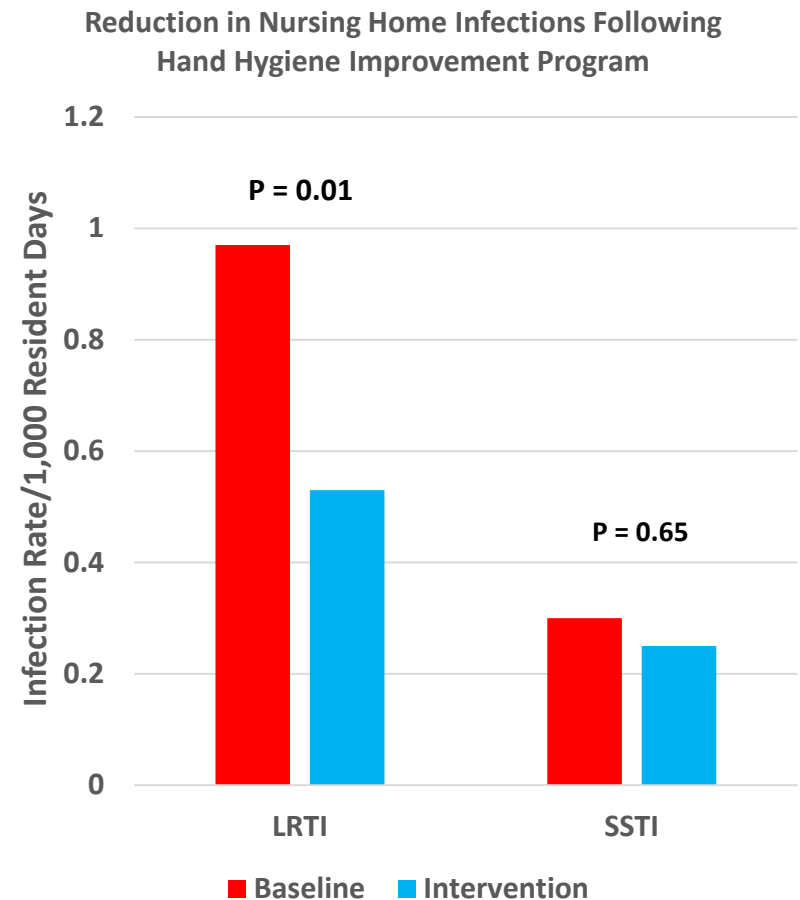
- Place in resident care areas and other locations.
- Provide ABHR in places where sinks cannot be added.
- Consider dispenser accessibility in multi-resident rooms.
- Obtain staff input on the accessibility of hand hygiene dispenser locations.



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

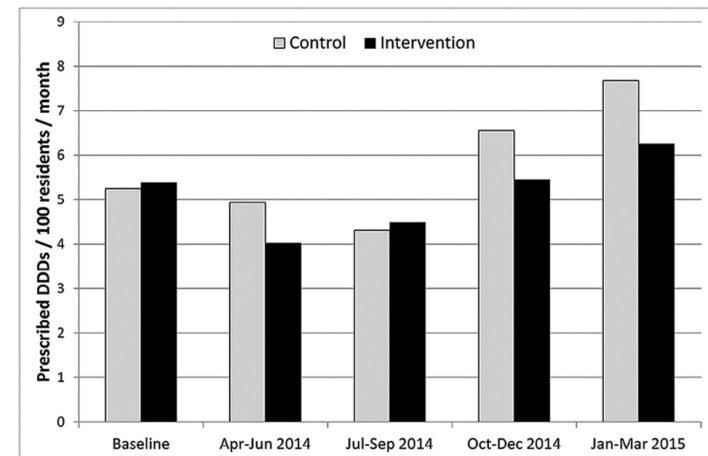
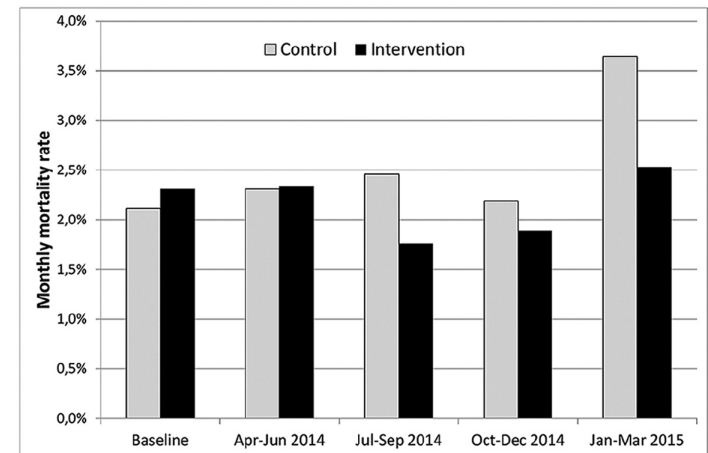
- Prospective hand hygiene improvement program in 174-bed LTCF
- Program elements included:
 - Switch from soap & water handwashing to use of ABHRs
 - Increased product availability
 - Education of HCP and residents
 - Posters placed throughout facility
 - Observation tool to monitor hand hygiene compliance
 - Included video on hand hygiene technique
- Results: Reduction in LRTIs and slight reduction in SSTIs



LRTI = lower respiratory tract infection
SSTI = skin and soft tissue infection

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



Source: WHO Guideline for Hand Hygiene

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

A Guide to the Application of the WHO Multimodal Hand Hygiene Improvement Strategy and the “My Five Moments for Hand Hygiene” Approach

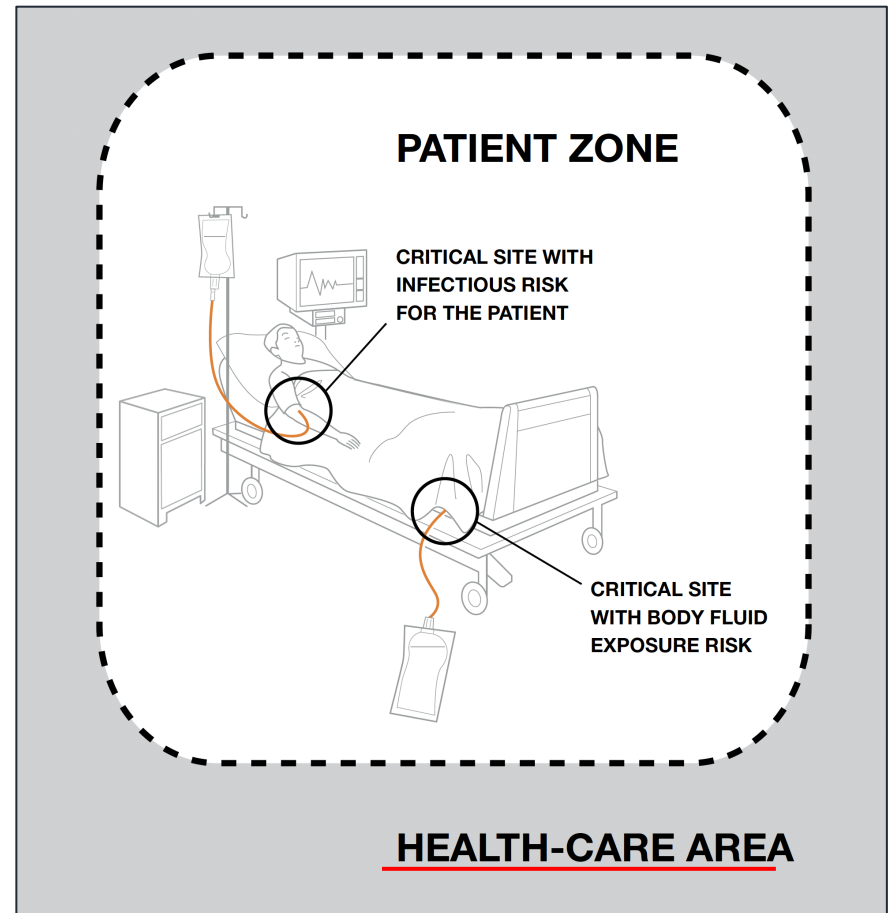


WHO Hand Hygiene in Outpatient and Home-based Care and Long-term Care Facilities

- **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” of an incontinent resident**
 - **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
 - surfaces in nursing station
 - equipment not dedicated to one patient [moved in and out of patient zones])

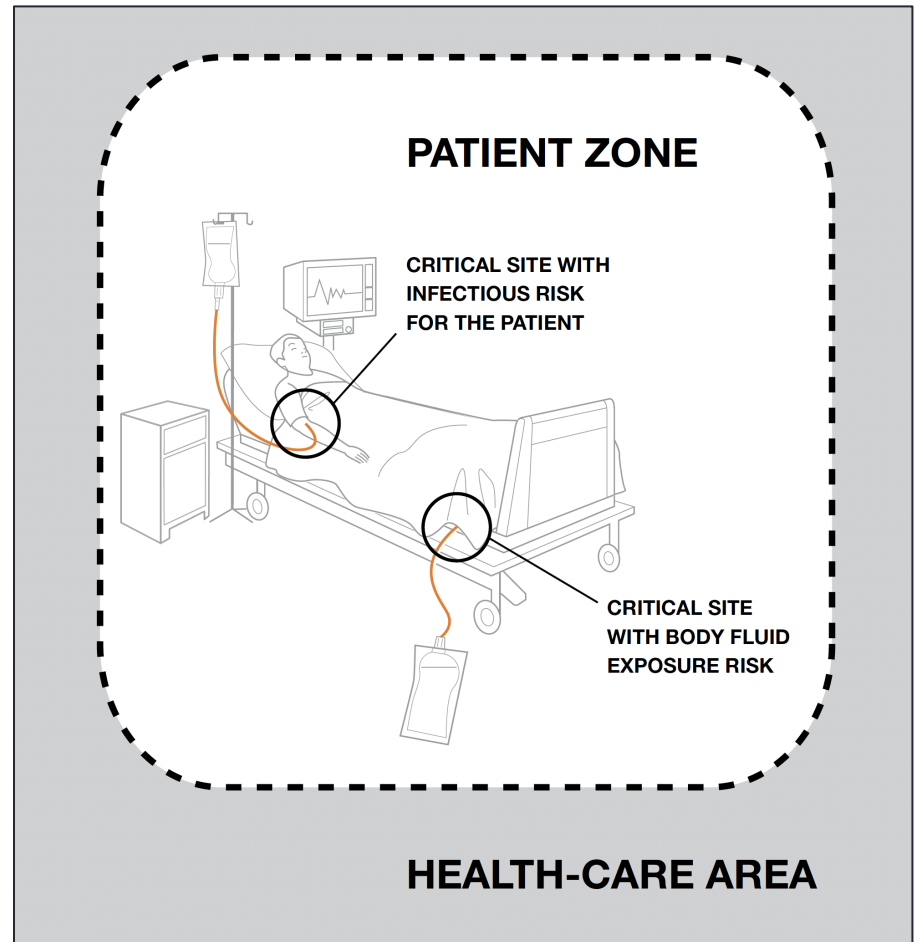


Patient Zone

- 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



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 injury. 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

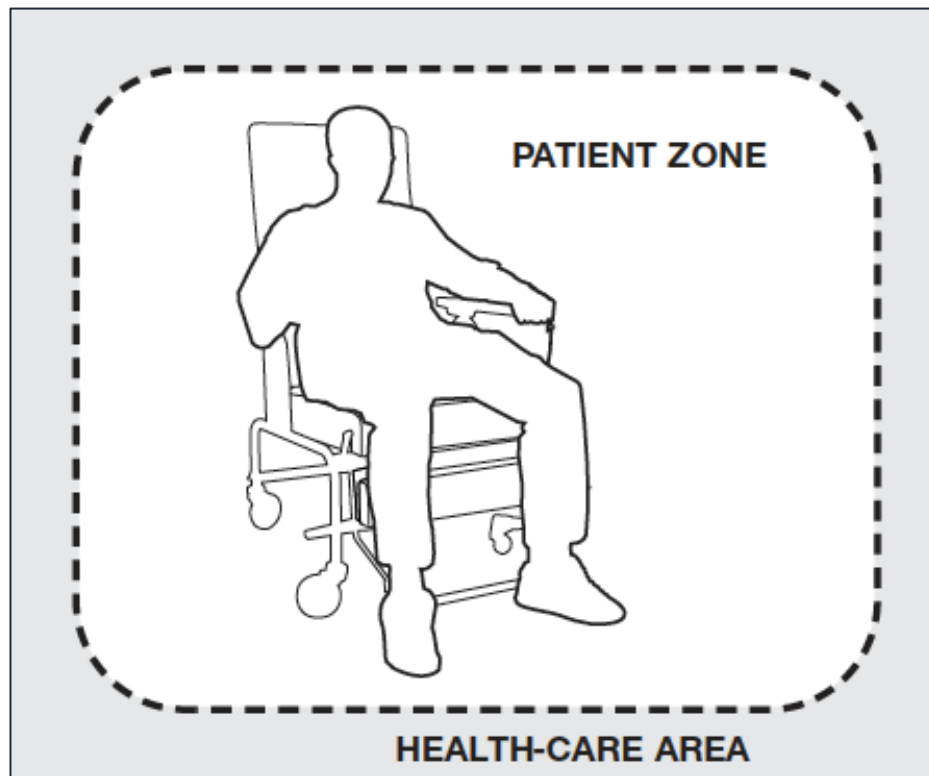
- How many times should the nurse have performed hand hygiene?**

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

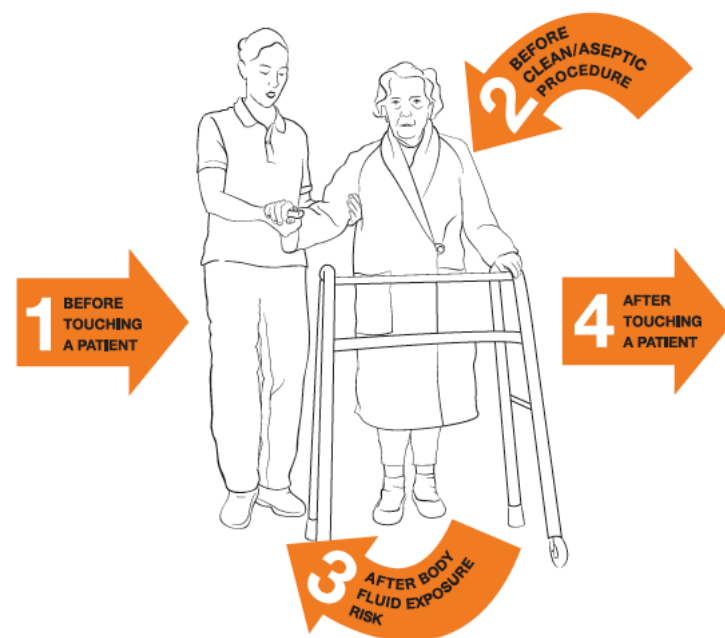
- **Upon entering the patient zone and before touching resident (Moment 1)**
- **Before donning gloves to perform an aseptic procedure (wound dressing change) (Moment 2)**
- **After removing gloves (Moments 3 and 4 combined)**

Examples of Temporary Patient Zones



Your Moments for Hand Hygiene

Health care in a residential home



WHO Hand Hygiene Technical Reference Manual

WHO – Hand Hygiene in Outpatient and Home-Based Care and LTCFs

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 [SAVE LIVES: Clean Your Hands](https://www.who.int/campaigns/save-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

<https://www.cdc.gov/hai/pdfs/containment/PPE-Nursing-Homes-H.pdf>

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