



The role of hand hygiene in limiting the spread of Multi Drug Resistant Organisms

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Hospital Infection Prevention Team

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Objectives

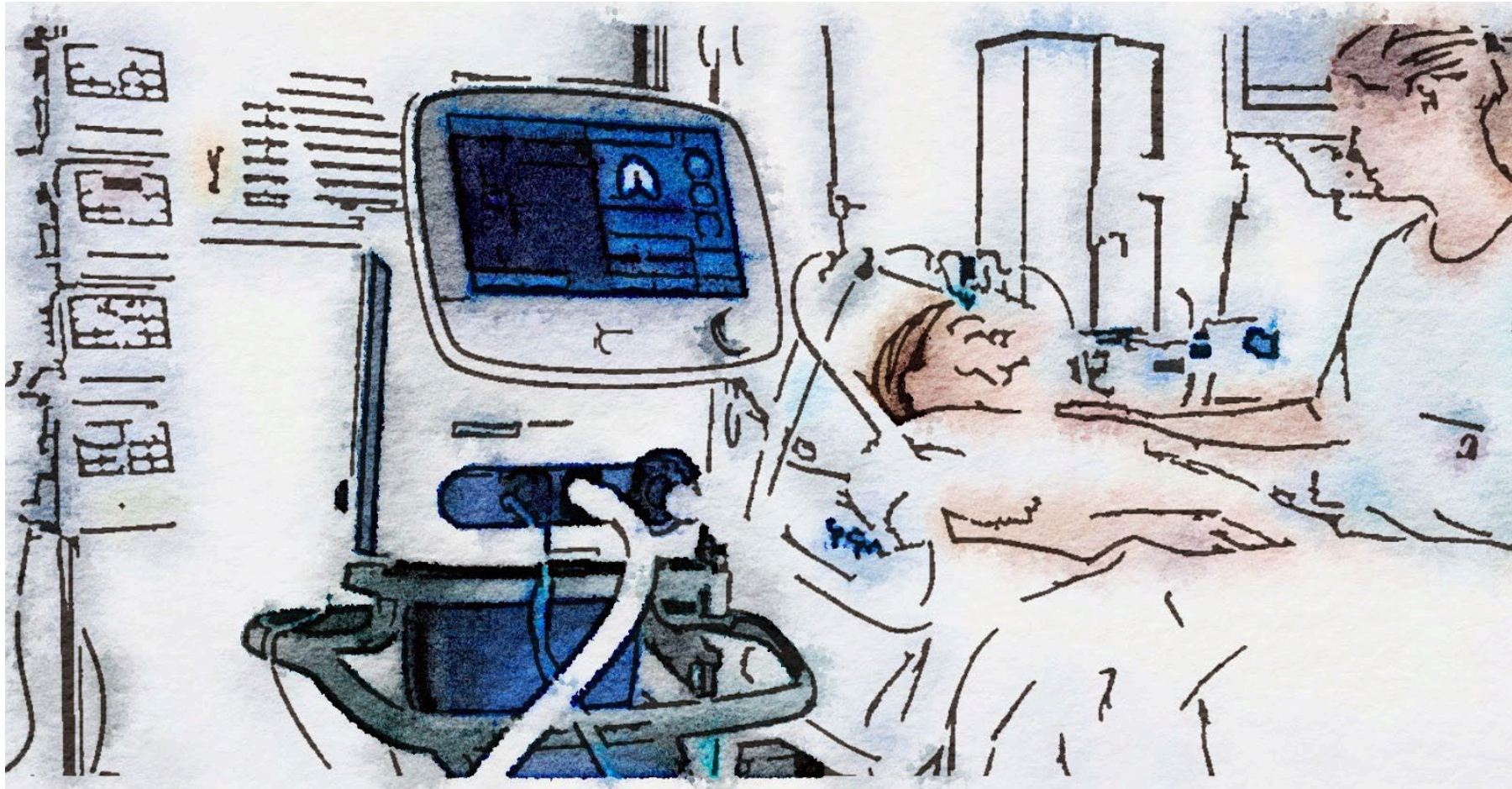
By the end of the webinar series, participants should:

1. describe how MDROs transmit through healthcare facilities.
 - a. Identify ways that the hands of healthcare personnel (HCP) may be involved in transmission of MDRO.
 - b. Describe the current state of hand hygiene in the United States.
2. identify infection prevention and control practices they should implement at their healthcare facilities to prevent MDRO transmission.
 - a. Define hand hygiene, including preferred methods to perform hand hygiene according to CDC indications.
 - b. Identify elements of a hand hygiene program that are needed to reduce transmission of MDRO via the hands of HCP.
 - c. Describe methods to monitor and improve hand hygiene.
3. develop an interdisciplinary plan with input from multiple healthcare personnel types that address improvements in communication of a patient/resident MDRO status both within their facility and with other facilities and providers.

Hand Hygiene

***The single most important action
all healthcare personnel can take
to prevent the spread of infection.***

Healthcare Personnel Hand Contamination



Brief interactions with the healthcare environment can result in hand contamination

A High Impact Intervention

Improvements in hand hygiene may reduce transmission more rapidly than improvements in environmental cleaning¹

- May be most pronounced in scenarios involving an MDRO that is environmentally hardy (such as *A. baumannii*)

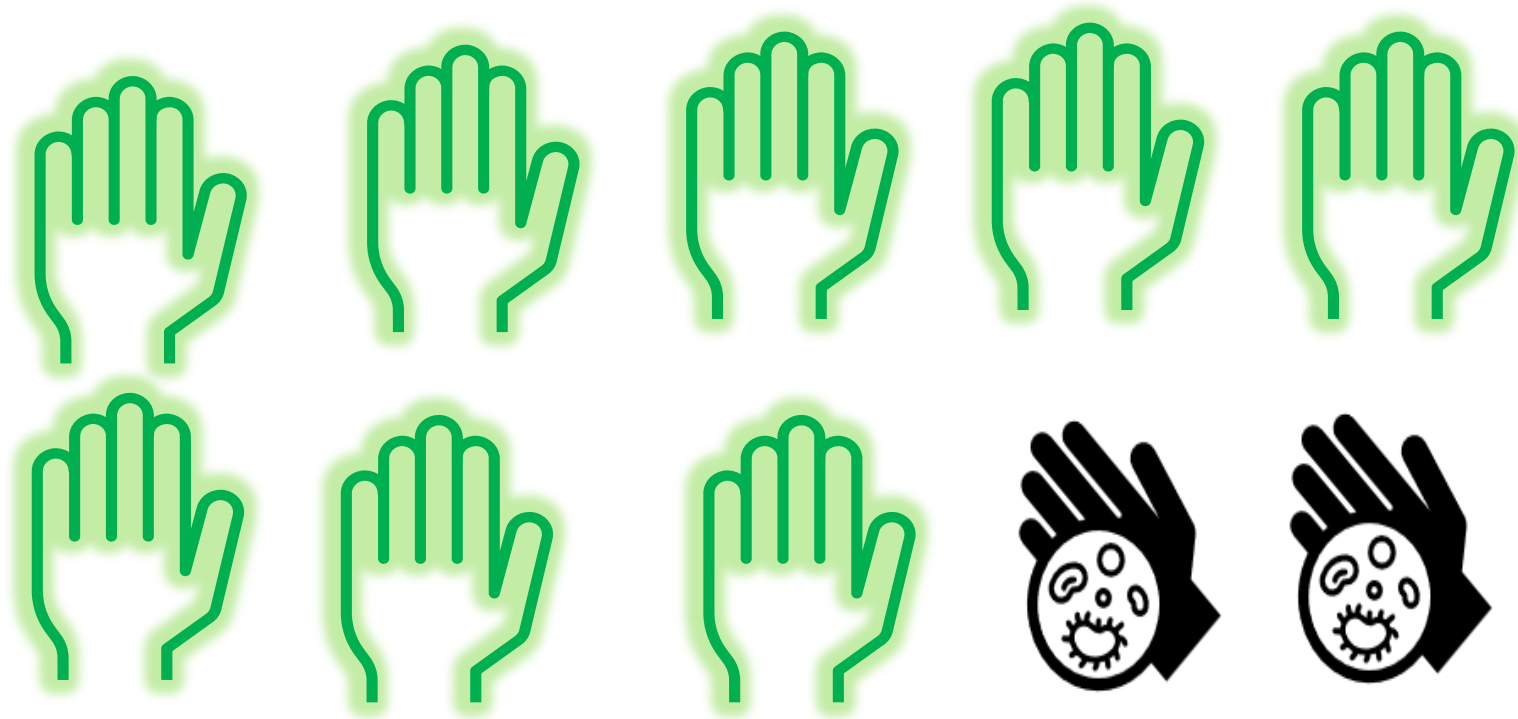
Very high compliance results in additional reductions in HAI²

- Seventeen-month observation period
 - Hand hygiene compliance was increased from 80% (high) to 95% (very high)
 - 197 fewer HAI, 22 fewer deaths, \$5million savings

1. Barnes SL. et al. ICHE 2014, 35:9; 156-1162

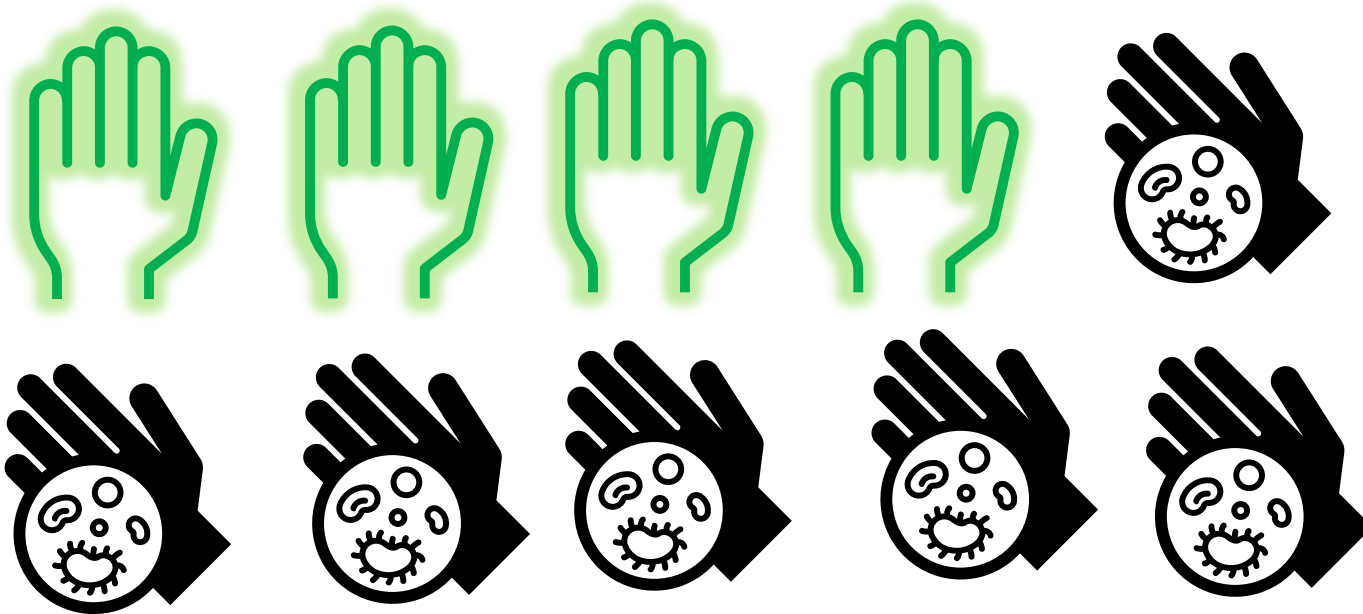
2. Sickbert-Bennett et al. EID 2016, 22:9; 1628-1630

How are healthcare personnel doing?



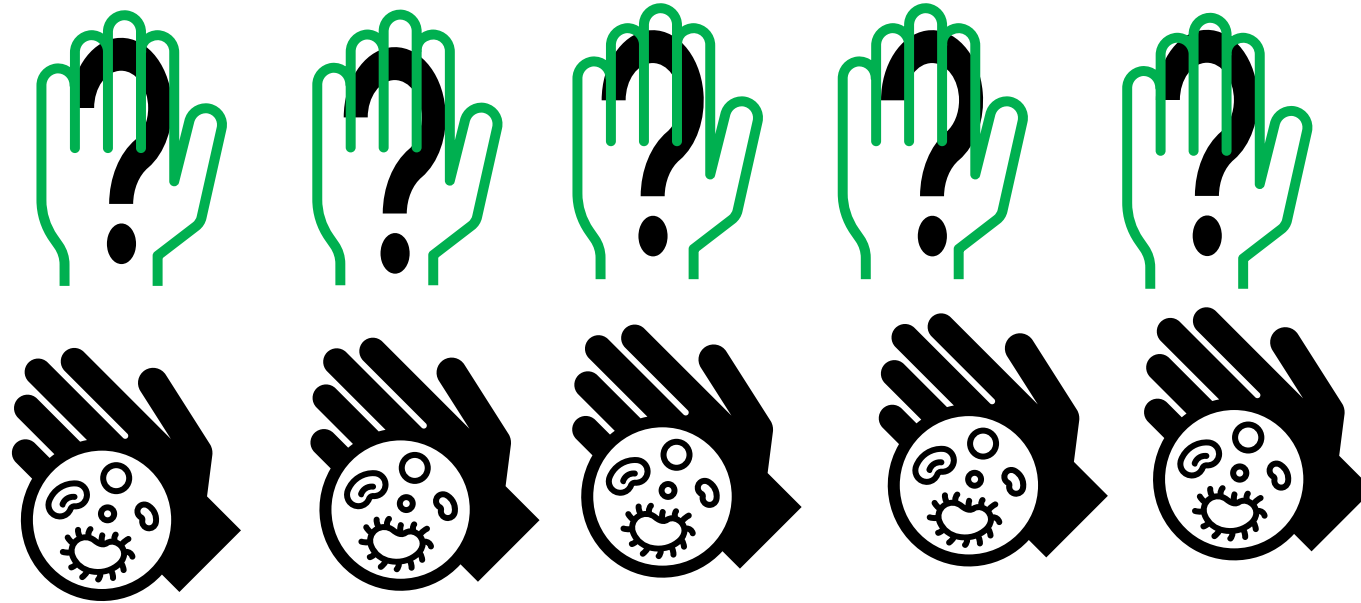
A point prevalence study using the WHO My 5 Moments indicated that **nurses** performed hand hygiene a little more than 80% of the time.

How are healthcare personnel doing?




A point prevalence study using the WHO My 5 Moments indicated that **physicians** performed hand hygiene a little more than 40% of the time.

How are healthcare personnel doing?



Researchers in a trauma resuscitation area reported 7% adherence rate overall, with no hand hygiene prior to clean procedures.... unless direct donning of gloves was considered adherent. If so, adherence rose to 57%.

Hand Hygiene Essential Practices

- **Promote the maintenance of healthy hand skin and nails**
 - **Select appropriate products**
 - **Ensure accessibility of hand hygiene supplies**
 - **Ensure appropriate glove use**
 - **Take steps to reduce contamination associated with sinks and sink drains**
 - **Monitor adherence**
 - **Provide timely and meaningful feedback**
- 

Healthy Hands

Healthy hands

Free from pathogens

Intact skin

- no redness, itching, cracking

Short natural nails

- no longer than the fingertip
- maintained according to facility policy



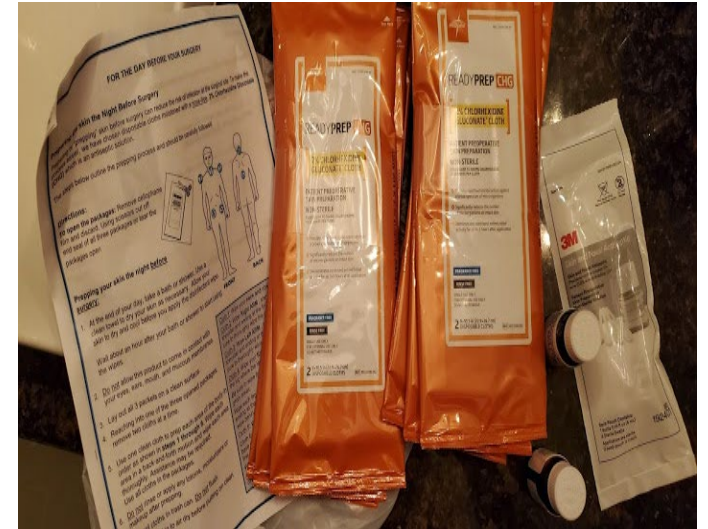
Common causes of hand skin irritation



Frequent handwashing or immersing hands in water



Wearing gloves



Exposure to antiseptics, including CHG

Irritant dermatitis

Begins on back of hands, skin folds

Initial tightness or dryness, cracking, redness, stinging when ABHS is applied

Associated with history of atopy, increased handwashing, use of gloves



Allergic dermatitis

May affect all areas of the hands; may also cause systemic symptoms (e.g., cough, wheeze)

Numerous potential allergens:

- rubber accelerators (nitrile glove manufacture),
- surfactants,
- CHG sensitization

May require patch testing for identification



To keep hands healthy:

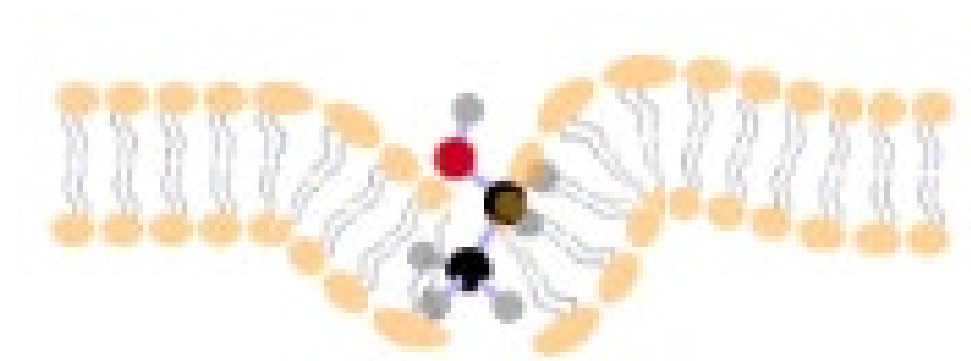
- Alcohol-based hand sanitizer is preferred in most clinical situations
- Reduce exposure to water
- Wear gloves when indicated
 - According to Standard and Contact Precautions
- Apply facility-approved moisturizer
- Seek consultation if redness, cracking, irritation occurs



When, Where, How to Clean Hands

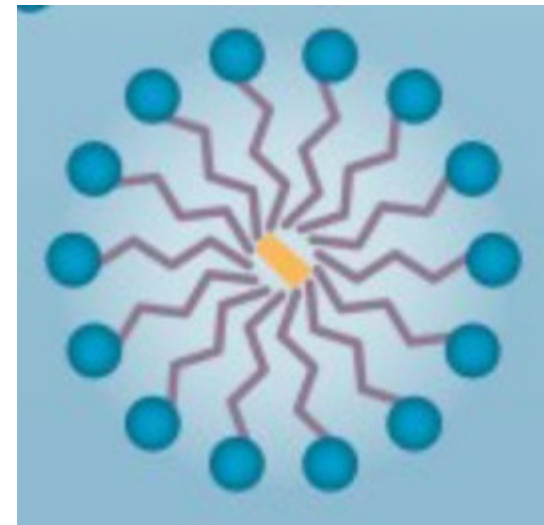
Modes of Action

Alcohol-based hand rub



Proteins are denatured

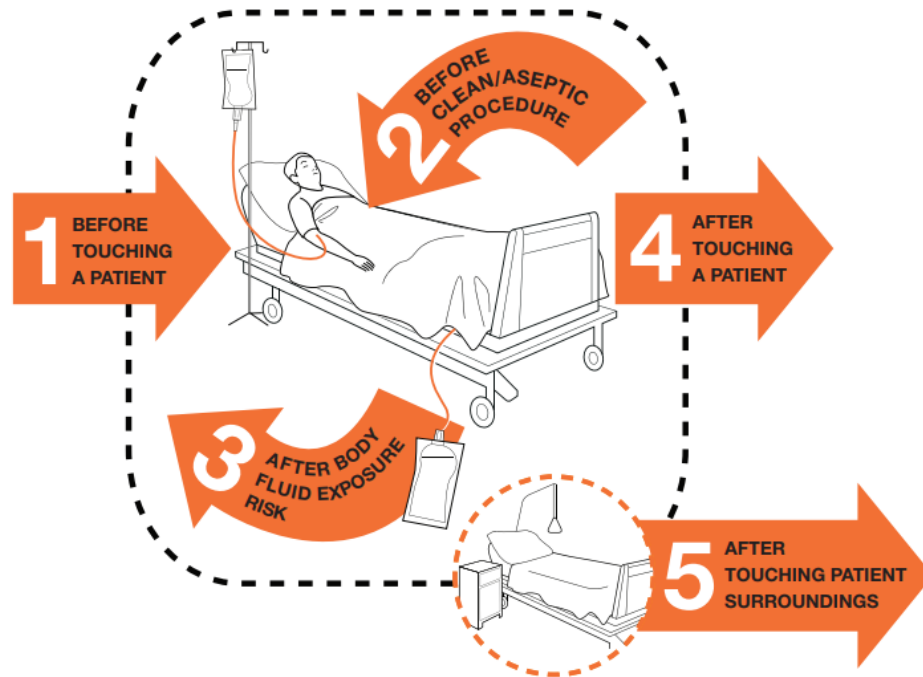
Soap and water



Organisms are surrounded by soap and removed by water

When to clean hands

Your 5 Moments for Hand Hygiene



CDC Core Practices adds:

When moving from a soiled task to a clean task.

Immediately after removing gloves

Access to hand sanitizer



Unambiguous, visible, in the workflow of healthcare personnel

How much ABHR is allowed?

Criteria	Requirement
Hand rub solution	Must not exceed 95% alcohol content by volume. (The Centers for Disease Control and Prevention recommends that ABHS contain at least 60% alcohol.)
Maximum dispenser fluid capacity	1.2 liters (41 ounces, 0.32 gal) for dispensers in rooms, corridors, and areas open to corridors. 2.0 liters (67 ounces, 0.53 gal) for dispensers in suites of rooms separated from corridors.
Maximum quantity of ABHS allowed in-use (i.e., in dispensers)	Ten gallons (37.8 L) in-use outside of a storage cabinet within a single smoke compartment.* One dispenser per room off corridors is NOT included in the calculation.
Minimum corridor width	Six feet (1830 mm) wide
ABHS dispenser distance from ignition sources	One-inch (25 mm) distance (horizontal or vertical) above, to the side, or beneath an ignition source** Note: While one-inch is acceptable, a more conservative approach is to ensure a distance of no less than 6 inches (12.7 mm; horizontal or vertical, measured from the center of the dispenser) between ABHR dispensers and source of ignition.
ABHS dispenser separation	Horizontal spacing not less than 48 inches (1220 mm).
Carpeted areas	The smoke compartment must be equipped throughout with an approved automatic sprinkler system.
Operation of the dispenser	The dispenser shall: <ul style="list-style-type: none"> • not release its contents except when the dispenser is activated, either manually or automatically by touch-free activation. • not dispense more solution than the amount required for hand hygiene consistent with label instructions. • be designed, constructed and operated in a manner that ensures accidental or malicious activation is minimized. • be tested in accordance with the manufacturer's care and use instructions each time a new refill is installed. Any activation of the dispenser shall only occur when an object is placed within 4 inches (100mm) of the sensor. An object placed within the activation zone and left in place shall not cause more than one activation.

Technique matters

Most importantly cover all surfaces of the hands!

A structured technique may help build habits.



1. Cover all surfaces of the hands



2. Rotational rubbing of fingertips in the palm of the alternate hand



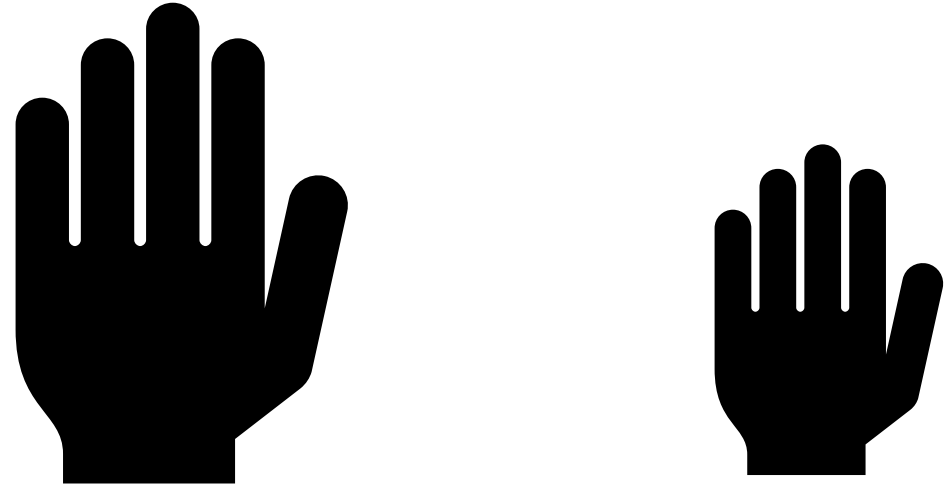
3. Rotational rubbing of both thumbs

Adjust the volume to hand size

Use enough rub to:

Cover all surfaces of the hand

Stay wet for at least 15 seconds



It may take 4-6 mL to cover large hands

Supplies for handwashing

- Plain or antimicrobial soap
- Disposable towels
- Warm (not hot) running water



Aim for visibility within the workflow of HCP, keep counter tops free from supplies.

If possible, use only for handwashing.

Glove Use

Wear Gloves

According to
Standard Precautions and
Transmission-based Precautions

Gloves
reduce hand contamination

STOP CONTACT PRECAUTIONS STOP
EVERYONE MUST:

-  Clean their hands, including before entering and when leaving the room.
- PROVIDERS AND STAFF MUST ALSO:**
-  Put on gloves before room entry. Discard gloves before room exit.
-  Put on gown before room entry. Discard gown before room exit.
Do not wear the same gown and gloves for the care of more than one person.
-  Use dedicated or disposable equipment. Clean and disinfect reusable equipment before use on another person.

16-618953-6182

 U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

To reduce hand contamination



Use well fitting gloves



Remove them carefully

Clean your hands immediately after removing gloves!

Items frequently contaminated by gloved hands



Disinfectant wipes, patient care equipment, durable medical equipment

Burdsall, 2017 *Am J Infect Control*

Do not routinely:



Double glove



Disinfect gloves

Contamination of hands and undergloves can occur during doffing; disinfecting gloves may interfere with glove performance

In certain specific job roles (e.g., anesthesiology) double gloving is recommended.

Pathogens of premise plumbing



Sink hygiene



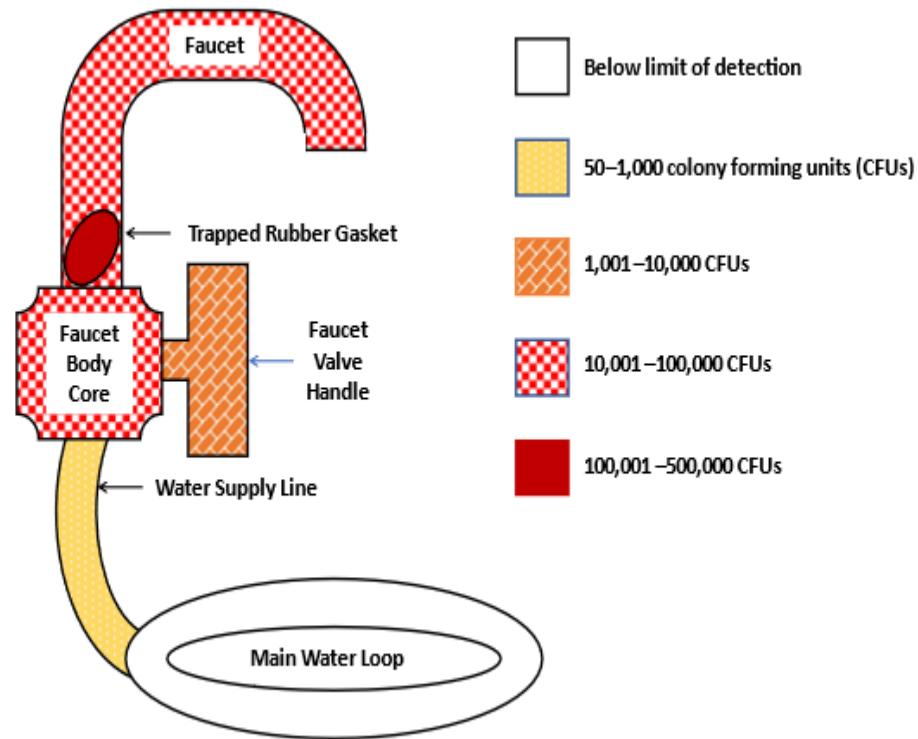
In an intensive care unit:

4% of behaviors at the sink involved handwashing.

37% involved medical care

56 activities involved disposal of nutrients that could promote microbial growth

The faucet as a reservoir of resistant organisms



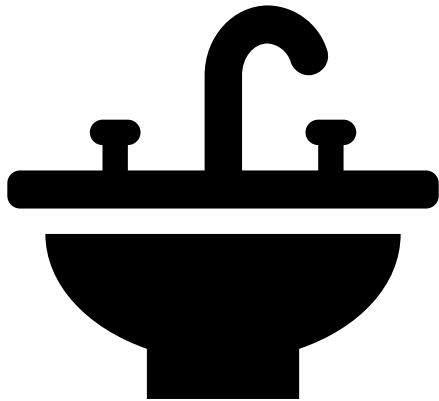
Splashing from drain to faucet can affect the clean water supply

Whole genome sequencing of VIM-Carbapenem resistant *Pseudomonas aeruginosa* identified 0-24 SNP differenced among environmental isolates and 3 patients admitted to the room with the contaminated faucet.

Unpublished data

Include handwashing sinks in

water management programs!



If feasible dedicate sinks to hand hygiene

Educate personnel to avoid behaviors that promote nutrient growth in sink drains

Maintain countertops free from patient care supplies

Monitoring and Feedback

Credible Hand Hygiene Data

- **Explicit expectations**
- **Trained observers**
- **Covert observations sessions are time limited**
- **Automated data is validated**



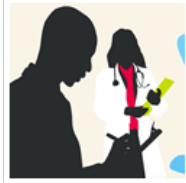
Commit to a Culture of Safety:

“shared values and commitment to a safe environment



Lowest Adherence

- Individual
- Theoretical risk, not linked to personal responsibility
- Minimal awareness of patient safety



Improved Adherence

- Blaming
- Risk is associated with failures in the practices of others
- Awareness of patient safety, citations



Highest Adherence

- Collaborative
- Responsibility to reduce risk of HAI is collective and shared
- Awareness of patient safety, empowerment

Measurement Methods



Method	Use
Direct Overt Observation	Evaluate Technique Inclusion in bundle checklists
Direct Covert	Evaluate technique Calculate adherence rates
Automated Monitoring Systems	Collect observations at all times, large data sets
Patient-as-observer	Use in outpatient areas where resources for observation are limited

How many observations should be collected?

- **Utilize a sampling plan**
 - Assess all areas/units on a routine (e.g. monthly) basis
 - Consider risk to individuals on the unit
 - Determine opportunities to be audited
- **Units with more patients and higher risk may need increased observations**
- **Consider using a formula to determine the number of observations to collect**

Hand Hygiene Opportunities: Acute Care

Consider attempting to observe 1% of opportunities

- *Number of open/staffed beds in unit * monthly occupancy rate in unit * no. of days in month * 30 observations = Hand hygiene opportunities*
- *30 open beds * .9 (90% occupancy rate) * 30 days * 30 opportunities = 24,300 opportunities*
- *1% of opportunities = 243/month*



Standard Precautions: Observation of Hand Hygiene Provision of Supplies

Instructions: Audit sinks and alcohol-based hand sanitizer (ABHS) dispensers intended for use in patient care areas. For each category, record the observation. In the column on the right, sum (across) the total number of “Yes” and the total number of observations (“Yes” + “No”). Sum all categories (down) for overall performance.



Standard Precautions: Observation Categories		Room 1	Room 2	Room 3	Room 4	Room 5	Summary of Observations	
		Yes No	Yes No	Yes No	Yes No	Yes No	Yes	Total Observed
1	Are functioning sinks readily accessible in the patient care area?	Yes No	Yes No	Yes No	Yes No	Yes No		
2	Are all handwashing supplies, such as soap and paper towels, available?	Yes No	Yes No	Yes No	Yes No	Yes No		
3	Is the sink area clean and dry?	Yes No	Yes No	Yes No	Yes No	Yes No		
4	Are any clean patient care supplies on the counter within a splash-zone of the sink?	Yes No	Yes No	Yes No	Yes No	Yes No		
5	Are signs promoting hand hygiene displayed in the area?	Yes No	Yes No	Yes No	Yes No	Yes No		
6	Are ABHS dispensers readily accessible?	Yes No	Yes No	Yes No	Yes No	Yes No		
7	Are ABHS dispensers filled and working properly?	Yes No	Yes No	Yes No	Yes No	Yes No		
Total YES and TOTAL OBSERVED								



Timely and Meaningful Feedback



- Most effective when performance is less than optimal
- Person responsible for feedback is a supervisor or colleague
- Is provided more than once
- Is provided verbally and in writing
- Includes clear targets and an action plan

Contacts

- **D.C. Health**
 - doh.hai@dc.gov
- **Maryland**
 - mdh.ipcovid@maryland.gov – Maryland HAI Group
 - mdphl.arln@maryland.gov – Mid-Atlantic Regional Lab
- **Virginia**
 - hai@vdh.virginia.gov
- **Massachusetts**
 - 24/7 Epidemiology Line with questions: 617-983-6800

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- **Please see registration flyer for CE information from this live event**
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 - **<https://www.vdh.virginia.gov/haiar/mdro-containment-webinar-series/>**
- **CE is also available on demand for the recording if any of your colleagues who didn't listen today would like to and receive CE in the future**

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THE ROLE OF HAND HYGIENE

IN LIMITING THE SPREAD OF MDROS

1

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2

Speakers:

- Dr. Janet Glowicz, PhD, RN

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In support of improving patient care, this activity has been planned and implemented by Centers for Disease Control and Prevention and D.C. Health, Massachusetts Department of Health, Maryland Department of Health and Virginia Department of Health. The Centers for Disease Control and Prevention is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

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Resources by Webinar Session

C. auris and CPO Colonization Screening 101 (CE CREDITS AVAILABLE)

In the second webinar as part of the CDC Mid-Atlantic webinar series, the presenters will compare the different types of surveillance screening options and discuss the logistics of conducting screening through the CDC's AR Lab Network. Recorded on November 15, 2021.

[View Recorded Webinar: Combating the Multidrug-Resistant Organism Together: C. auris and CPO Colonization Screening 101 \(YouTube\)](#)

[View Slides: Colonization Screening 101 \(PDF\)](#)

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