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

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Disclosures

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- Presentations will not include any discussion of the unlabeled use of a product or a product under investigational use.

- CDC did not accept commercial support for this continuing education activity
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

Improvements in hand hygiene may reduce transmission more rapidly than improvements in environmental cleaning\(^1\)

- 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 HAI\(^2\)

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

Bruhwasser, 2016 Am. J Infect Control
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.

Bruhwasser, 2016 *Am. J Infect Control*
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%.

Haac, 2017 Injury
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

Barnes, 2019 *Am J Infect Control*
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

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

Chan, 2013 Infect Control Hosp Epidemiol
## How much ABHR is allowed?

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hand rub solution</strong></td>
<td>Must not exceed 95% alcohol content by volume. (The Centers for Disease Control and Prevention recommends that ABHS contain at least 60% alcohol.)</td>
</tr>
<tr>
<td><strong>Maximum dispenser fluid capacity</strong></td>
<td>1.2 liters (41 ounces, 0.32 gal) for dispensers in rooms, corridors, and areas open to corridors.</td>
</tr>
<tr>
<td></td>
<td>2.0 liters (67 ounces, 0.53 gal) for dispensers in suites of rooms separated from corridors.</td>
</tr>
<tr>
<td><strong>Maximum quantity of ABHS allowed in-use</strong></td>
<td>Ten gallons (37.8 L) in-use outside of a storage cabinet within a single smoke compartment.*</td>
</tr>
<tr>
<td></td>
<td>One dispenser per room off corridors is NOT included in the calculation.</td>
</tr>
<tr>
<td><strong>Minimum corridor width</strong></td>
<td>Six feet (1830 mm) wide</td>
</tr>
<tr>
<td><strong>ABHS dispenser distance from ignition</strong></td>
<td>One-inch (25 mm) distance (horizontal or vertical) above, to the side, or beneath an ignition source**</td>
</tr>
<tr>
<td>sources</td>
<td>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.</td>
</tr>
<tr>
<td><strong>ABHS dispenser separation</strong></td>
<td>Horizontal spacing not less than 48 inches (1220 mm).</td>
</tr>
<tr>
<td><strong>Carpeted areas</strong></td>
<td>The smoke compartment must be equipped throughout with an approved automatic sprinkler system.</td>
</tr>
<tr>
<td><strong>Operation of the dispenser</strong></td>
<td>The dispenser shall:</td>
</tr>
<tr>
<td></td>
<td>• not release its contents except when the dispenser is activated, either manually or automatically by touch-free activation.</td>
</tr>
<tr>
<td></td>
<td>• not dispense more solution than the amount required for hand hygiene consistent with label instructions.</td>
</tr>
<tr>
<td></td>
<td>• be designed, constructed and operated in a manner that ensures accidental or malicious activation is minimized.</td>
</tr>
<tr>
<td></td>
<td>• be tested in accordance with the manufacturer’s care and use instructions each time a new refill is installed.</td>
</tr>
<tr>
<td></td>
<td>Any activation of the dispenser shall only occur when an object is placed within 4 inches (100mm) of the sensor.</td>
</tr>
<tr>
<td></td>
<td>An object placed within the activation zone and left in place shall not cause more than one activation.</td>
</tr>
</tbody>
</table>
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
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

Grabowski 2018
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

<table>
<thead>
<tr>
<th>Method</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Overt Observation</td>
<td>Evaluate Technique Inclusion in bundle checklists</td>
</tr>
<tr>
<td>Direct Covert</td>
<td>Evaluate technique Calculate adherence rates</td>
</tr>
<tr>
<td>Automated Monitoring Systems</td>
<td>Collect observations at all times, large data sets</td>
</tr>
<tr>
<td>Patient-as-observer</td>
<td>Use in outpatient areas where resources for observation are limited</td>
</tr>
</tbody>
</table>
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
# 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.

<table>
<thead>
<tr>
<th>Standard Precautions: Observation Categories</th>
<th>Room 1</th>
<th>Room 2</th>
<th>Room 3</th>
<th>Room 4</th>
<th>Room 5</th>
<th>Summary of Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are functioning sinks readily accessible in the patient care area?</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Are all handwashing supplies, such as soap and paper towels, available?</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Is the sink area clean and dry?</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Are any clean patient care supplies on the counter within a splash-zone of the sink?</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Are signs promoting hand hygiene displayed in the area?</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Are ABHS dispensers readily accessible?</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Are ABHS dispensers filled and working properly?</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
</tr>
</tbody>
</table>

## 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

Ivers et al. Cochrane Library, 2012;1
Contacts

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  - doh.hai@dc.gov

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  - 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
CE Information and Recording

- Please see registration flyer for CE information from this live event

- The recording and slides will be posted to this website:

- 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
A REGIONAL CONTAINMENT WEBINAR SERIES LED BY CDC
THE ROLE OF HAND HYGIENE
IN LIMITING THE SPREAD OF MDROS

1. Objectives:
   1. Describe how MDROS can occur through healthcare facilities.
   2. Identify ways that the hands of healthcare personnel (HCPs) may be involved in transmission of MDROS.
   3. Review the current state of hand hygiene in the United States.
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   7. Review methods to monitor and improve hand hygiene.
   8. Develop an interdisciplinary plan with input from multiple healthcare personnel types that address improvements in communication of a patient with MDROS status both within their facility and with other facilities and providers.

2. Registration:
   • Dr. Jason Gluwein, Ph.D., RN

3. Accreditation Requirements:
   In support of improving patient care, this activity has been planned and implemented by the Centers for Disease Control and Prevention and the American Nurses Credentialing Center. This activity was planned and implemented in collaboration with AGES Education, Inc. The American Nurses Credentialing Center has accredited this activity for 1.0 Continuing Education Contact Hour(s) (CECH). (Provider number: 0970-0005-22-00062-H098). Providers will award credit according to ACPCP guidelines.

4. WebCast Instructions for Unlimited Concurrent Education (CE):
   - To receive contact hours, the webinar must be viewed in its entirety.
   - The course starts at 12:00 PM (ET).

5. Non-Personalized Instructions for E-Learning Continuing Education (CE)!
   - To receive continuing education (CE) for MDGOA-B-00925-22, The Role of Hand Hygiene in Limiting the Spread of MDROS, please visit TEA and follow the instructions below on May 18, 2022.
   - Complete the webinar at: https://www.mdhealth.gov/facilities/virtual-learning-center-webinar-series/
   - Pass the post-test at 75% of the available questions
   - This is for those who will be attending on the 18th.

CE Available for the Webinar!

Fees: There are no fees for CE.
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To receive continuing education (CE) for WC4526-051822-The Role of Hand Hygiene in Limiting the Spread of MDROs please visit TCEO and follow these 9 Simple Steps before June 22, 2022
- The course access code is MDRO2022
- Register for webinar at: https://cdc.zoomgov.com/webinar/register/WN_K9fM46PfSfGzVdnymG9e9w
- Complete the Evaluation at www.cdc.gov/GetCE
- Pass the posttest at 75% at www.cdc.gov/GetCE

On-Demand Instructions for Obtaining Continuing Education (CE):
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- Complete the activity at: https://www.vdh.virginia.gov/haiar/mdro-containment-webinar-series/
- Complete the Evaluation at www.cdc.gov/GetCE
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- Note: This is for those who watch the recording on the VDH HAI site and then want CE credit afterward

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FEES: There are no fees for CE.
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CDC Regional Containment Webinar Series

The next Regional Containment Webinar will be held on Wednesday, May 18, 2022 from 12:00 - 1:00 PM EST

Title: The Role of Hand Hygiene in Limiting the Spread of MDROs

Register now for Hand Hygiene webinar

Free CE Available!

A REGIONAL CONTAINMENT WEBINAR SERIES LED BY CDC
THE ROLE OF HAND HYGIENE IN LIMITING THE SPREAD OF MDROS

REGISTER HERE!

Join us for the webinar on Wednesday, May 18, 2022 from 12:00 - 1:00

D.C. HEALTH

Maryland
DEPARTMENT OF HEALTH
Resources by Webinar Session

C. auri 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. auri and CPO Colonization Screening 101 (YouTube)

View Slides: Colonization Screening 101 (PDF)

Event Details

CE Information:

ACCREDITATION STATEMENTS:

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For more information, contact CDC
1-800-CDC-INFO (232-4636)

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