What Are the 5 Moments for Hand Hygiene, and How Can We Use Them to Provide Safe Care?

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Presentation Objectives

• Briefly describe the burden of infections in postacute and long-term care facilities, and need for improved hand hygiene

• Review sources from which healthcare workers (HCWs) contaminate their hands

• Describe the concepts of the 5 Moments for Hand Hygiene
  — Patient zone, health-care zone, and indications for hand hygiene

• Briefly discuss hand hygiene methods and technique

• Discuss monitoring hand hygiene compliance

• Mention hand hygiene promotion strategies

Why Do We Need Improved Hand Hygiene?

• Over 2 million infections occur annually in postacute care and long-term care settings in the United States

• Infections are associated with $4 billion in associated costs

• Most common infections in postacute care settings and long-term care facilities (LTCFs) involve:
  — Urinary tract
  — Respiratory tract
  — Skin and soft tissues

Moody L. Curr Opin Infect Dis 2018;31:359
Frequency of Multidrug-Resistant Organisms (MDROs) in Postacute and Long-Term Care Patients

- Infections are often caused by multidrug-resistant organisms (MDROs)
  - Examples: MRSA, VRE, and resistant Gram-negative bacilli
  - Associated with poor outcomes
- Study performed in 14 nursing homes in Michigan
  - Overall, 51% of residents were colonized in 1 or more MDROs

Body sites commonly colonized with MDROs Among LTCF Residents

- MRSA: nares and hands
- VRE: perianal and hands
- Resistant Gram-negative rods: perianal and groin
- Among LTCF residents known to be MRSA-positive
  - 60% had positive hand cultures

Frequency of Colonization of LTCF Residents with Antimicrobial Resistant Pathogens

- Graph showing the frequency of colonization of LTCF residents with various antimicrobial resistant pathogens.

Clinical studies cited:
- Mody L. Curr Opin Infect Dis 2018;31:359
Frequency of Glove and Gown Contamination Among HCWs Caring for LTCF Residents with MRSA Colonization


Frequency of Hand Contamination Among LTCF Personnel

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

Percent of Skin Cultures Positive for C. difficile in LTCF Residents with C. difficile diarrhea, Asymptomatic Carriage and Non-Carriers

Frequency of Acquisition of *Clostridium difficile* on Sterile Gloves After Contact with Skin Sites

Contamination of Glove Following Contact with Patient with *Clostridium difficile*

Percent of Environmental Cultures Positive for *C. difficile* in LTCF Residents with *C. difficile* diarrhea, Asymptomatic Carriage and Non-Carriers


Why is Hand Hygiene Important?

- Postacute care patients and long-term care residents often harbor MDROs at multiple body sites
- Environmental surfaces near patients are often contaminated with MDROs
- HCWs have ample opportunities to contaminate their hands or gloves by touching patients or environmental surfaces near them
- Hand hygiene is considered one of the most important measures for preventing healthcare-associated infections (HAIs)

Boyce JM & Pittet D. CDC Guideline for Hand Hygiene in Healthcare Settings, 2002
World Health Organization Guideline for Hand Hygiene in Health Care, 2009

HICPAC/SHEA/APIC/IDSA 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 then with feedback on their performance

Boyce JM & Pittet D et al. MMWR 2002;51 (RR-14):1-45
2009 World Health Organization (WHO) Guidelines on Hand Hygiene in Health Care

Developed by a team of >100 international experts, led by Prof. Didier Pittet

www.who.int/gpsc/5may/en/

The Five Components of the WHO multimodal hand hygiene improvement strategy (WHO-5)

1a. System change – Alcohol-based handrub at point of care

1b. System change – access to safe, Continuous water supply, soap and towels

2. Training and education

3. Evaluation and feedback

4. Reminders in the workplace

5. Institutional safety climate

www.who.int/gpsc/5may/tools/training_education/en/
Your 5 Moments for Hand Hygiene

1. Before touching a patient
2. Before touching patient’s clean intact skin
3. After touching patient’s clean intact skin
4. After performing a patient care task
5. After removing gloves

Patient Zone

- Patient zone includes:
  - the patient
  - 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 Temporary Patient Zones

Health-Care Area

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

Moment 1

- When: Before touching a patient
  - Required when moving from health-care area into the patient zone
- Why: To protect the patient from acquiring harmful germs carried on the hands of HCWs

Moment 2

- When: Immediately before accessing a critical site with infectious risk for the patient
  - After touching a surface in the health-care area or patient zone
  - Before any clean or aseptic procedure involving direct or indirect contact with invasive medical devices, mucous membranes or non-intact skin
- Why: Prevent transmission of germs to the patient
  - from one body site to another in the same patient
  - from the health-care area to the patient by inoculation
Moment 3

- **When:**
  - As soon as possible after a procedure involving potential exposure to body fluids (and after glove removal)
  - Indicated even contact with blood or body fluids is minimal or not visible
  - Before contact with the patient, other surfaces in the patient zone or in the health-care zone

- **Why:**
  - To protect the HCW from acquiring the patient's germs
  - To prevent spread of the patient's germs to the health-care area

Moment 4

- **When:**
  - After having touched the patient
  - Usually at the end of the encounter or when the encounter is interrupted
  - After contact with the patient's intact skin or clothing
  - Before contact with surfaces in the health-care area

- **Why:**
  - To protect the HCW from acquiring the patient's germs
  - To protect surfaces in the health-care area from contamination

Moment 5

- **When:**
  - After touching any object or furniture in the patient zone (without having touched patient)
  - Includes after touching surfaces in temporary patient zone dedicated to a patient in an outpatient setting
  - Before contact with surfaces in the health-care zone

- **Why:**
  - To protect the HCW from being contaminated or colonized by patient's germs that may be present on surfaces/objects in patient zone
  - To prevent spread of the patient's germs to the health-care area
Coincidence of Two Indications for Hand Hygiene

Only 1 hand hygiene action is needed


Essential Elements of Hand Hygiene

Education and Feedback

• 5 Moments for Hand Hygiene
  — Provide HCWs with an understanding of when they should clean their hands
  — Provide patients with safer care and help protect HCWs

• Education of HCWs also needs to address:
  — Preferred method of hand hygiene
  — Recommended hand hygiene technique

• Monitoring hand hygiene compliance

• Providing HCWs with feedback regarding their performance

Hand Hygiene Knowledge Among LTCF Personnel

• Questionnaire survey of 184 nursing homes in 14 states

• 1,626 respondents (licensed - 50.6%, unlicensed – 49.4%)

• Results:
  — Percent of personnel who knew that alcohol-based hand rubs are the most effective method
    • Licensed: 11.7%
    • Unlicensed: 10.6%
  — Percent of personnel who knew how long to rub hands together
    • Licensed: 28.5%
    • Unlicensed: 25.2%

Trautner BW et al. Infect Control Hosp Epidemiol 2017;38:83
What is the Preferred Method of Hand Hygiene in Long-Term Care Facilities?

1) Washing hands with soap & water

2) Using an alcohol-based hand rub (ABHR)

What is the Preferred Method of Hand Hygiene?

1) Washing hands with soap & water

2) Using an alcohol-based hand rub (ABHR)
  - True for acute care, postacute care and LTCFs

What is the Preferred Method of Hand Hygiene?

- ABHRs are the preferred method of hand hygiene
  - ABHRs reduce bacterial counts on hands more effectively than handwashing with soap & water when hands are not visibly contaminated

- Current, well-formulated ABHRs cause less skin dryness and irritation than frequent handwashing with soap & water

- Increased use of ABHRs has been shown to increase hand hygiene frequency rates in hospitals and LTCFs

Boyce JM & Pittet D CDC Guideline for Hand Hygiene in Healthcare Settings, 2002
World Health Organization Guideline for Hand Hygiene in Health Care, 2009
WHO – Hand Hygiene in Outpatient and Home-Based Care and LTCFs

Mody L et al. Infect Control Hosp Epidemiol 2003;24:165
How Long Should HCWs Rub Their Hands Together When Using an ABHR?

1) Less than 5 seconds

2) 5 to 14 seconds

3) 15 to 29 seconds

4) 30 or more seconds

CDC: Does not give recommended duration
- States that less than 10 seconds probably not adequate

WHO: Recommends that the duration of hand hygiene be:
- 20 - 30 seconds when using an ABHR
- 40 - 60 seconds when using soap & water

Recent study by Pires et al. found that 15 seconds was as effective as 30 seconds

Study of multiple ABHRs found average time needed for hands to feel dry was 17-26 seconds for most products

World Health Organization Guideline for Hand Hygiene in Health Care, 2009
Pires D et al. Infect Control Hosp Epidemiol 2017;38:547
Macinga DR et al. Infect Control Hosp Epidemiol 2013;34:299
Checking Hand Hygiene Technique

- Hand hygiene technique issues include:
  - Is alcohol-based handrub applied to all surfaces of the hands?
- Fluorescent dye can be added to alcohol-based handrub to check for surfaces commonly missed
  - Thumbs
  - Fingertips
- Rub hands together and cover all surfaces of hands & fingers


Hand Hygiene and Gloves

- If you wore gloves when delivering care to a patient or resident, is hand hygiene necessary after removing gloves?
  1) NO - gloves prevent you from contaminating your hands
  2) YES – hand hygiene is still necessary

Hand Hygiene and Gloves

- If you wore gloves when caring for a patient or resident, is hand hygiene necessary after removing gloves?
  1) NO - gloves prevent you from contaminating your hands
  2) YES – hand hygiene is still necessary after removing gloves
- Multiple studies have shown that hands can still become contaminated even though gloves were worn

Chen R et al. JAMA 1999;270:250
Hayden MK et al. Infect Control Hosp Epidemiol 2008;29:149
Morgan DL et al. Infect Control Hosp Epidemiol 2010;31:716
The Five Components of the WHO multimodal hand hygiene improvement strategy (WHO-5)

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www.who.int/gpsc/5may/tools/training_education/en/

Evaluation and Feedback: Methods for Monitoring Hand Hygiene Compliance

- Direct observations by expert observers
- Consumption of hygiene products such as ABHR, soap, or towels
- Automated monitoring systems

Marra AR et al. Clin Microbiol Infect 2014;20:29
Sigley JA et al. J Hosp Infect 2015;89:51
Boyce JM Am J Infect Control 2017;45:528

Monitoring Hand Hygiene Compliance Using Direct Observation by Trained Observers

- Advantages
  - Determine compliance with all 5 Moments for Hand Hygiene
    - Automated methods cannot monitor Moments 2 and 3
  - Evaluate hand hygiene technique
    - Duration of hand rub
    - Is hand hygiene performed at appropriate times during episode of care
  - Provide immediate feedback to healthcare personnel
    - Real-time coaching
    - Identify barriers to hand hygiene

Boyce JM Am J Infect Control 2017;45:528
Monitoring Hand Hygiene Compliance Using Direct Observation by Trained Observers

• Limitations
  – Lack of standardized methods precludes comparison of hospitals
  – Evaluates < 1% of all hand hygiene opportunities
  – Hawthorne effect may overestimate compliance rates 1.5 to 3-fold
  – Time-consuming
    • Average number of hand hygiene opportunities (HHOs) that can be observed in 1 hr of observation = 18 (range 3.3 – 41.4)
    • In a hospital with a 70% compliance rate, it is estimated it would require 153 observations per nursing unit per time period (e.g. month) to accurately detect a 10% change in compliance
    • Many hospitals have difficulty providing sufficient auditors

Boyce JM. Am J Infect Control 2017;45:528

Tips on Direct Observation of Hand Hygiene

• Provide observers with standardized training
  – Include videos in training if possible
• Have hand hygiene expert periodically validate the accuracy of observers
• Avoid having HCWs perform observations on their own unit/floor
  – Consider using “secret shoppers”
• Limit observation periods to < 20 min
• Perform observations at times when patient care is frequently administered
• Use an app to record observations

Chen LF et al. Infect Control Hosp Epidemiol 2013;34:207
Boyce JM. Am J Infect Control 2017;45:528

Automated Monitoring of Product Usage

• Electronic devices can be placed inside product dispensers
• Electronic devices record each time the dispenser is accessed (HH event)
• HH events are time/date stamped
• HH Event data can be sent wirelessly to a computer server for analysis of hand hygiene frequency

Mora AR et al. Infect Control Hosp Epidemiol 2010;31:796
Sodre da Costa LS. Am J Infect Control 2013;41:997
Automated Hand Hygiene Monitoring Systems

- Group monitoring systems estimate hand hygiene compliance, by nursing unit or ward
- Badge-based systems provide hand hygiene performance data for individual HCWs
- Video camera systems also provide HCW-specific data
- Currently, many of these systems may be too expensive for LTCFs

Marra AR et al. Clin Microbiol Infect 2014;20:29
Srigley JJ et al. J Hosp Infect 2015;89:S1
Boyce JM Am J Infect Control 2017;45:528

Additional Promotional Activities in LTCFs

- Examples of additional strategies to promote improved hand hygiene in LTCFs
  - Instructional videos
  - Demonstrations related to hand hygiene technique
  - Interactive educational modules
  - Pre- and post education surveys

Mody L et al JAMA Intern Med 2015;175:714

Hand Culture Plates to Assess Technique

Mody L et al JAMA Intern Med 2015;175:714
Consider Promoting Patient Hand Hygiene

- Consider providing selected patients with ABHR
  - May need to avoid patients with dementia or history of alcohol abuse
- Assist them with application
- Make ABHR available in convenient and easy-to-use form
  - Individual, single-dose packet
  - Single-use towelette packet
  - Small, flip-top bottle
  - May be more difficult for some elderly to open
- Single-dose or single-use format should minimize risk of ingestion

Knighton SC et al. Am J Infect Control 2017;45:626
Rai H et al. Am J Infect Control 2017;45:1033
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

4 Moments for Patient Hand Hygiene

- One study found that only 10% of patients performed hand hygiene
  - 13% before meals
  - 8% after using bathroom
- Intervention included providing hospitalized patients with indications for hand hygiene (4 Moments)
- Program resulted in significantly increased hand hygiene among patients

Impact of Improving Hand Hygiene on HAI Rates

- Systematic review of 41 hand hygiene studies & impact on HAIs
- Single interventions gave modest improvement
- WHO multimodal strategy yielded better results
- Additional strategies associated with improved hand hygiene:
  - Setting compliance goals
  - Incentives or rewards
  - Encouraging personal accountability

Sunkesula VC et al. Infect Control Hosp Epidemiol 2015;36:986

Luangsanatip N et al. BMJ 2015;351:h3728
Challenges to Improving Hand Hygiene in LTCFs

• Survey of 1143 individuals in 17 nursing facilities in 6 states identified knowledge, attitudes and barriers to hand hygiene

• 29.7% stated that they would not change their hand hygiene practices regardless of guideline recommendations
  — ~20% felt that guidelines were impractical

• ~21% of employees either did not receive training in hand hygiene during the previous year, or were uncertain if they had received training

Ashraf MS et al. Infect Control Hosp Epidemiol 2010;31:758

Challenges to Improving Hand Hygiene in LTCFs

• Barriers affecting hand hygiene in LTCFs
  — Staffing shortages of nurses and CNAs
  — Limited financial resources of LTCFs
  — Insufficient hand hygiene product availability
  — Limited in-house infection prevention/control resources

• HCW beliefs that affect hand hygiene practices in LTCFs
  — Too busy to wash hands
  — Senior personnel and colleagues don’t wash hands
  — Absence of alcohol-based handrub, soap & water, sink
  — Didn’t wash because I wore gloves
  — Repeated handwashing will damage my skin
  — Just went into the resident’s room to talk

Ashraf MS et al. Infect Control Hosp Epidemiol 2010;31:758
Herzig CTA et al. J Am Med Dir Assoc 2016;17:85

Take Home Messages

• ABHRs reduce bacterial counts on hands more effectively than handwashing with soap & water when hands are not visibly contaminated
  — ABHRs are the preferred method of hand hygiene in acute care, postacute care and long-term care settings

• Current, well-formulated ABHRs cause less skin dryness and irritation than frequent handwashing with soap & water

• There is considerable opportunity to improve hand hygiene compliance in postacute and long-term care settings

Boyce JM & Pittet D. CDC Guideline for Hand Hygiene in Healthcare Settings, 2002
World Health Organization Guideline for Hand Hygiene in Health Care, 2009
SHEA/IDSA Practice Recommendation on Hand Hygiene, 2014
Take Home Messages

- Improving hand hygiene requires a multimodal strategy
- ABHR should be made readily available to HCWs
- Education of personnel in postacute and long-term care facilities should include:
  - Review of sources of hand contamination and the role of hand hygiene in reducing HAIs
  - Description of the 5 Moments for Hand Hygiene, patient zone and the health-care zone
  - Review of recommended hand hygiene technique
- Monitoring of hand hygiene compliance and providing HCWs with feedback regarding their performance are essential

Free Online Resources

SHEA: SHEA‐Online.org → Practice Resources → Strategies to Prevent HAIs
http://www.shea‐online.org/index.php/practice‐resources/priority‐topics/compendium‐of‐strategies‐to‐prevent‐hais

CDC: https://www.cdc.gov/handhygiene/index.html

WHO: http://www.who.int/gpsc/5may/EN_GPSC1_PSP_HH_Outpatient_care/en/