

Nursing Home Infection Prevention: The Role of the Environment and Hand Hygiene Monitoring

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Objectives

1. Determine appropriate products for environmental cleaning
2. Discuss cleaning of shared equipment in the nursing home setting
3. Describe effective training and cleaning methods
4. Determine best methods for hand hygiene monitoring

How Big is the Problem?

There are between 1.6-3.8 million Health Care-Associated Infections (HAIs) in nursing homes every year.

These infections result in:

- 150,000 hospitalizations
- 388,000 deaths
- \$673 million to \$2 billion in additional health care costs

(Castle, et al. Nursing Home Deficiency Citations, AJIC, May 2011;39,4)

Most Common HAIs

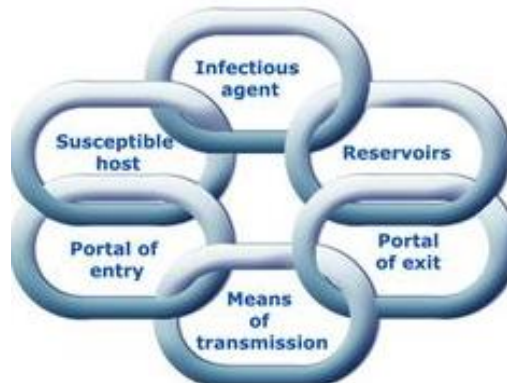
- Urinary tract infections
- Lower respiratory infections
- Skin and soft tissue infections
- Antibiotic resistant Staphylococcal infections
- Gastroenteritis

Why is This Important?

Residents are more susceptible due to:

- Comorbidities
- Malnutrition
- Dehydration
- Functional impairments – incontinence
- Medications that reduce immunity or mobility
- Length of stay – more opportunity for exposure to infectious agents from socialization between residents

Chain of Infection



Chain of Infection

- Infectious Agent – bacteria
- Reservoir – resident or environment
- Portal of Exit – how does it exit resident
- Means of Transmission – contact, droplet, etc.
- Portal of Entry – how does it enter next resident
- Susceptible Host

Combined = Infection

Breaking the Chain of Infection

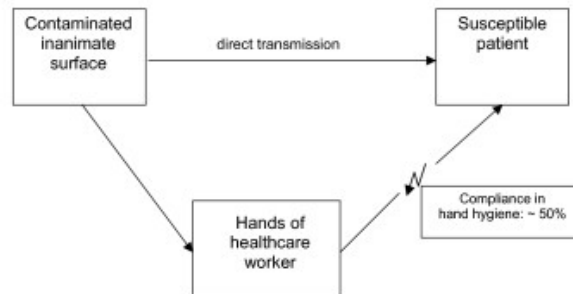
Chain can be broken at any link to prevent an infection

Today we will focus on two interventions related to Means of Transmission link

- Role of the environment, cleaning, and disinfection
- Hand hygiene

Common Modes of Transmission from Inanimate Surfaces to Susceptible Patients

BMC Infect Dis. 2006; 6: 130



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What Role Does the Environment Play in Transmission?

Not definitively known

Person admitted to room previously occupied by a Methicillin Resistant Staph Aureus (MRSA) or Vancomycin Resistant Enterococcus (VRE) positive person is at significant risk of acquiring that bacteria. Similar findings for *C. difficile*

• Rutala 2012

Common pathogens persist on surfaces for an extended length of time

How Long Do Organisms Live on Surfaces?

Norovirus – 3 weeks

Rotavirus – 3mos.

VRE – 4 mos.

C. diff – 5 mos.

E. coli – 16 mos.

Adenovirus – 3 mos.

M. TB – 4 mos.

Acinetobacter – 5 mos.

Staph (incl. MRSA) – 7 mos.

HIV – can stay viable up to a week

Soft surfaces harbor organisms longer

Cleaning

Physical removal of foreign material

- Dust, soil, blood, secretions

Removes rather than kills organisms

- Accomplished with water, detergent, and mechanical action

Always essential prior to disinfection

- Surface that has not been cleaned cannot be properly disinfected

Disinfection

- Inactivation (killing) of disease producing microorganisms
- Usually involves chemicals, heat, or ultraviolet light (UV)
- Used on inanimate objects – not living tissue

Disinfection

- Clean first – then disinfect
- Contact time = the amount of time needed to inactivate (kill) the microorganisms
- The time the surface must remain wet for the product to work – check the label
- Varies with the product – 1-10 minutes
- Do you know the contact time for the products you use?

Environmental Protection Agency (EPA)

- EPA regulates the licensing of disinfectants
- List K – EPA's Registered Antimicrobial Products Effective Against *Clostridium difficile* spores
 - Bleach 1:10 dilution must be made fresh daily
 - Pre-made stable solutions are available
- Wipes and liquids available

Cleaning and Disinfecting Who is Expected to Do What? Do They Know What is Expected?

What is done by clinical staff – CNA/RN?

What is done by Environmental Services staff?

What is done by food services workers?

Clinical Staff CNA/RN

Items that may go from resident-to-resident, including but not limited to:

- Glucometers – manufacturer guidelines
- Nail clippers, scissors, razors
- Lifts (and slings)
- Wheelchairs
- Gait belts
- Shower chairs and commodes
- Bath tubs

How is process adapted if patient is on contact precautions for *C. difficile* or general gastrointestinal illness?

Cleaning / Disinfecting Glucometers in the LTC Setting

ASCP's Summary of Glucometer Cleaning Guidelines
– February 2010

Long-term care facilities recently have been cited for inadequately cleaning or disinfecting glucometers used by multiple residents.

Be sure you are familiar with which glucometer manufacturer(s) your facility uses and the cleaning procedures recommended by that manufacturer(s).

If the manufacturer does not provide specific cleaning recommendations or as a conservative approach to infection control for glucometers with minimal cleaning requirements, facilities may want to consider cleaning glucometers with high-level disinfectants.

Be familiar with the amount of time the disinfectant solution is supposed to contact the equipment or how long active cleaning should be performed to ensure complete disinfection. (Check disinfectant manufacturer "instructions for use" and label.)

Equipment: Nail Clippers, Scissors, and Razors

- Clean and disinfect between residents
- Can you dedicate equipment to each resident?
- Product labeled for this purpose:
 - Approved combination germicide, pseudomonas, fungicide, and a viricide

Wheelchairs

Process/Schedule

- Who is assigned responsibility?
- Who is auditing for completion?
- Visibly contaminated
- Between residents
- Resident on contact precautions
- Resident with wound drainage and/or incontinence
- Transport wheelchairs

Lifts, Slings and Gait Belts

Process for this?

- Dedicated slings and gait belts?
 - Hoyer vs. Stand Up lift
 - Risk for contact with skin
- Adequate stock for laundering
- Cleaning schedule for the lifts themselves

Shower Chairs, Commodes and Bathtubs

Clean/disinfect between resident use

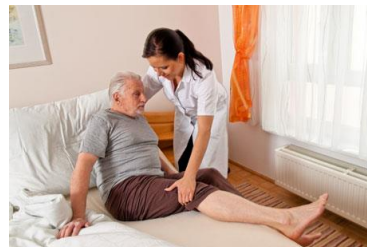
- Monitoring, auditing and documenting
- Appropriate disinfectant products
 - Look at the label!

Environmental Services

- Facility staff or contracted staff?
- Does contract specify products used?
- Who trains staff?
- Who tracks competency? Frequency of training?
- Do they get Infection Prevention specific training?
 - Basic understanding of why they are required to do things a certain way

Hand Hygiene (HH)

SAVE LIVES
Clean **Your** Hands



Hand Hygiene Definitions

Hand hygiene refers to the act of cleansing hands with water or liquids and includes the use of water, soaps, antiseptics, or other substances, including alcohol-based hand rubs.

- **Antiseptic Handwash** – Washing hands with water and soap or other detergents containing an antiseptic agent.
- **Antiseptic Hand Rub** – Applying antiseptic hand-rub product to all surfaces of the hands to reduce the number of organisms present.
- **Hand Hygiene** – Handwashing, antiseptic handwash, antiseptic hand rub, or surgical hand antisepsis.
- **Handwashing** – Washing hands with water and plain (i.e. non-antimicrobial) soap.

<http://www.cdc.gov/nhsn/pdfs/training/ltc/nhsn-ltcf-prevention-process-training-v2.pdf>

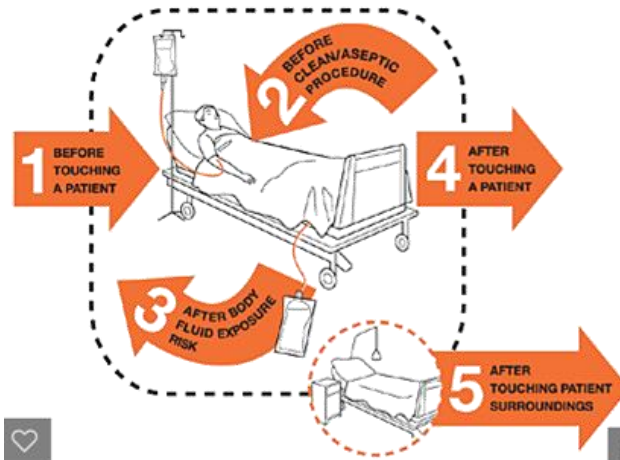
Hand Hygiene 5 Moments – World Health Organization (WHO)

FIGURE 1

Illustration of the “My Five Moments for Hand Hygiene” concept



Resident with Invasive Device



Hand Hygiene

- Hand hygiene is widely recognized as the most important measure to prevent the spread of infection.
- Despite evidence that improving hand hygiene reduces the risk of infection and improves patient outcomes, compliance with hand hygiene remains low.
- Published data ranges from 18 percent – 80 percent compliance.

Hand Hygiene Checklist

- Training, competency
 - Are staff clear on expectations?
- Correct products
- Adequate supplies in convenient locations
- Refills of supplies – who can do this?
 - Building a culture of team/all responsible expectation

Hand Hygiene Monitoring

Is hand hygiene being done at each of the five moments?

Rate of performance

- Do we know how we are doing?
- How do different wings/floors or disciplines compare to others?
- Does your staff know what their performance is?

Hand Hygiene Monitoring Challenges

- Process should not detract from or impede clinical care
- Process must be economically feasible – many elaborate costly systems available
- Self-reporting may not be valid
- Amount of product used is hard to correlate with the amount of product that should have been used
- Monitor all staff including providers

Resident/Family Involvement

- Residents with cognitive ability to participate
- Family survey at Care Plan meetings
- Concerns for accuracy
- Concerns for resident/family recognizing when HH should be done

Current State Assessment Survey: Advancing Excellence

Current activities survey:

SECTION 1. KNOWLEDGE AND COMPETENCY				
		YES	NO	N/A
Q1	Does your facility have an annual hand hygiene training program for all healthcare personnel?			
Q2	Can healthcare personnel describe situations when hand washing with soap and water is preferred over use of alcohol-based hand products?			
Q3	Does your nursing home assess healthcare personnel hand hygiene technique (i.e., they can do hand hygiene properly)?			
Q4	Does your nursing home assess healthcare personnel knowledge of indications for hand hygiene during resident care activities?			
Q5	Do residents and family members receive education about the importance of hand hygiene in prevention of the spread of infections?			
SECTION 2. INFECTION PREVENTION POLICIES AND INFRASTRUCTURE				
		YES	NO	N/A
Q1	Does your nursing home have a written hand hygiene policy?			
Q2	Has your nursing home assessed the availability of hand hygiene products in all resident care areas?			
Q3	Has your nursing home assessed healthcare personnel satisfaction with hand hygiene products available in all resident care areas?			
Q4	Does your nursing home utilize cues to action (e.g., posters, pamphlets, resident engagement) to enhance healthcare personnel and visitors awareness and performance of appropriate hand hygiene?			
SECTION 3. MONITORING PRACTICES				
		YES	NO	N/A
Q1	Does your nursing home monitor healthcare personnel adherence to hand hygiene at regular intervals?			
Q2	Does your nursing home have a process for providing feedback to healthcare personnel about hand hygiene performance?			

* Healthcare personnel - All paid and unpaid persons working in the healthcare setting. Resident care areas - Areas in the nursing home where direct resident care is provided (for example, resident rooms, common bathing room, therapy rooms, procedure/exam rooms, etc.)

https://www.nhqualitycampaign.org/files/HandHygiene_Assessment.pdf



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Tools: CDC's Hand Hygiene Quiz

- <http://www.cdc.gov/handhygiene/providers/training/index.html>
- Series of questions - education
- Quick, simple
- Gather data for quality improvement



REASONS YOU GAVE THAT PREVENT YOU FROM PRACTICING HAND HYGIENE:

Lack of soap or hand sanitizer

If alcohol rubs or soap dispensers are frequently empty, let someone know so that a system can be put in place to assure a constant supply. Also, if alcohol-based rub bottles/dispensers are inconveniently placed, consider discussing it with your unit leadership to find better locations.

<http://www.quickmedical.com/blog/post/germstar-hand-hygiene-quiz.html>



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iScrub App

- Free app to monitor hand hygiene for iPhone/pad
- Can designate different locations, floors, halls, etc.
- Can record different job classes, physician, RN, MA, etc.
- Download data at the end of designated period (month)

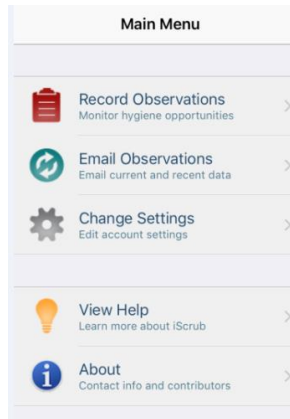
iScrub App



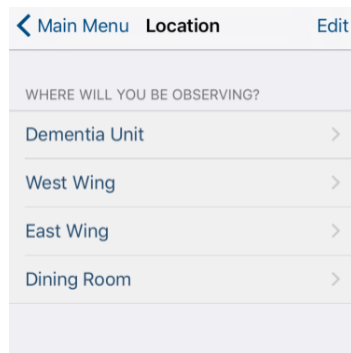
<https://compepi.cs.uiowa.edu/iscrub/>

iScrub 1.5 Lite is a free hand hygiene application for the Apple iPhone/iPod Touch. You may download the app directly from the iTunes app store via your device or by clicking [here](#) and installing through iTunes.

iScrub App Main Menu



Locations



Staff Type

< Location Job Role Done

DINING ROOM: 0 UNSENT OBS.

-
- Nurse
- Consultant
- Phys Ther
- Dietary Aide
- CNA
- Add new job role

iScrub Data

	B	C	D	E	F	G
1	location	HCW	opportunity	deviceName	note	HandHygiene Compliance
2	Dementia Unit	CNA	Out of Room	Emily's iPhone	C.N.A. (EN) did not complete HH after completing catheter care	Rub
3	Dementia Unit	CNA	Out of Room	Diane's iPhone	Medical Director did not complete HH after assessing pressure injury	Wash

CDC: National Healthcare Safety Network (NHSN) can be used to track HH

Prevention Process Measures Module: Hand Hygiene (HH) Event Reporting Gown/Glove (GG) Use Event Reporting

Purpose:

To calculate rates of adherence to HH and/or GG use opportunities
among all healthcare personnel (HCP) in a facility

To assess the impact of efforts to improve HH and/or GG use practices
by HCP over time

Can complete HH and/or GG monitoring via NHSN

<http://www.cdc.gov/nhsn/pdfs/training/nhsn-hcp-prevention-process-training-v2.pdf>

CDC: National Healthcare Safety Network (NHSN)

Numerator: # Hand Hygiene Performed

Denominator: # Hand Hygiene Indicated

$N/D \times 100 = \text{Hand Hygiene Percent Adherence}$
Higher Percentages are Better!

CDC: National Healthcare Safety Network (NHSN)

Perform at least 30 unannounced observations of health care workers of varied occupational types after contact with a resident or inanimate objects in resident's vicinity each month

Could train staff other than DON, IP, to complete this observation

CDC: National Healthcare Safety Network

Monthly Monitoring Forms

- Customize



Form Approved
OMB No. 0920-0666
Exp. Date: 12/31/2018
www.cdc.gov/nhsn

Prevention Process Measures Monthly Monitoring for LTCF

Page 1 of 1

*required for saving

**conditionally required based upon monitoring selection in Monthly Reporting Plan

Facility ID #:	*Month:	*Year:	*Location Code:
Prevention Process Measures			
Hand Hygiene		Gown and Gloves	
**Performed:		**Used:	
**Indicated:		**Indicated:	

Hand Hygiene Promotion

- Hand Hygiene Pledge – have staff sign large poster; post in visible area
- Posters – remember to rotate often
 - CDC, WHO, APIC, State Health Department, do image search...
- Contests – one wing/hall/floor to another
- Small token of appreciation when “caught” doing it right; can be an entry for small give away (coffee shop coupon each month)
- Get data back to staff!

Regulations

F441

- “The facility must establish and maintain an Infection Control Program designed to provide a safe, sanitary, and comfortable environment to help prevent the development and transmission of disease and infection.

Regulations

F441 (Continued)

- “The facility must establish an infection control program under which it---
 - Investigates, controls and prevents infections in the facility
 - Decides what procedures, such as isolation, should be applied
 - Maintains a record of incidents and corrective actions related to infections”

Regulations

F441 (Continued)

- Preventing the Spread of Infection
 - Isolate the resident, when determined need
 - Prohibit employees with communicable disease or infected skin lesions from direct contact with residents or their food, if direct contact will transmit the disease
 - Require staff to wash their hands after each direct resident contact for which hand washing is indicated

Regulations

Wisconsin

F441

- 2nd most frequently cited tag in Q3 of 2016
—150 citations, two harm or IJ
- Most frequently cited tag in 2015

Data from State of WI, Department of Health Services, Division of Quality Assurance

New Regulation

CFR 483.80 (a)(1)-(3)

The facility must establish and maintain an infection prevention and control program designed to provide a safe, sanitary, and comfortable environment and to help prevent the development and transmission of communicable diseases and infections.

(1) A system for preventing, identifying, reporting, investigating, and controlling infections and communicable diseases for all residents, staff, volunteers, visitors, and other individuals providing services under a contractual arrangement based upon the facility assessment conducted according to § 483.70(e) and following accepted national standards;

New Regulation

- (2) Written standards, policies, and procedures for the program, which must include, but are not limited to:
- (i) A system of surveillance designed to identify possible communicable diseases or infections before they can spread to other persons in the facility;
 - (ii) When and to whom possible incidents of communicable disease or infections should be reported;
 - (iii) Standard and transmission-based precautions to be followed to prevent spread of infections;
 - (iv) When and how isolation should be used for a resident; including but not limited to:
 - (A) The type and duration of the isolation, depending upon the infectious agent or organism involved, and
 - (B) A requirement that the isolation should be the least restrictive possible for the resident under the circumstances.
 - (v) The circumstances under which the facility must prohibit employees with a communicable disease or infected skin lesions from direct contact with residents or their food, if direct contact will transmit the disease; and
 - (vi) The hand hygiene procedures to be followed by staff involved in direct resident contact.

New Regulation

An antibiotic stewardship program that includes antibiotic use protocols and a system to monitor antibiotic use (Phase 2 implementation, 11/28/17)

- (4) A system for recording incidents identified under the facility's IPCP and the corrective actions taken by the facility

New Regulation

Infection preventionist ([Phase 3 Implementation, 11/28/19](#))

- (1) Have primary professional training in nursing, medical technology, microbiology, epidemiology, or other related field;
 - (2) Be qualified by education, training, experience or certification;
 - (3) Work at least part-time at the facility; and
 - (4) Have completed specialized training in infection prevention and control.
- (c) IP participation on quality assessment and assurance committee. The individual designated as the IP, or at least one of the individuals if there is more than one IP, must be a member of the facility's quality assessment and assurance committee and report to the committee on the IPCP on a regular basis.

New Regulation

Annual review. The facility will conduct an annual review of its IPCP and update their program as necessary.

QAPI

HH monitoring could be your next QAPI
Project/Performance Improvement Project (PIP)

- Use QAPI tools to structure the project
 - Goals Setting Worksheet
 - Root Cause Analysis (Five Whys)
 - Plan-Do-Study-Act Cycle
- Data – Easy to collect
 - Where you are, where you want to be via benchmarking

Q & A

Thank you!

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Resources Used

Healthcare Environmental Cleaning, Association for the Healthcare Environment (AHE)

Environmental Protection Agency – List K

World Health Organization (WHO) – Hand Hygiene in Outpatient, Home-Based Care and Long Term Care Facilities

ASCP's Summary of Glucometer Cleaning Guidelines – February 2010

Association For Professionals In Infection Control And Epidemiology (APIC) Implementation Guide – Hand Hygiene

FDA – FDA High Level Disinfectant List

<http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/ReprocessingofReusableMedicalDevices/ucm437347.htm>

https://www.nhqualitycampaign.org/files/HandHygiene_Assessment.pdf



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