Infection Prevention Fundamentals Part 1

vSNF Workgroup

May 4, 2022

Healthcare-Associated Infections Program
Center for Health Care Quality
California Department of Public Health

Housekeeping Reminders

This session is being recorded

If your name does not show up, please “right click” to rename

Please stay muted if you are not speaking

To comment, you can unmute or type into the Chat

Agenda

12-12:05PM	Welcome
12:05-1:25PM	The Role of Hand Hygiene in Infection Prevention The Role of the Environment in Infection Prevention
1:25-1:30PM	Next Steps

Tools for Implementing a Quality Improvement Project

Tools for Implementing a Quality Improvement Project			
Institutional Support and Infrastructure	**Training and Education**	**Reminders in the Workplace**	**Evaluation and Feedback**
	Hand Hygiene		
Gain leadership approvals for participation	Slides/flipchart for healthcare worker education sessions Hand washing (video)	*My 5 Moments for Hand Hygiene* poster Hand hygiene technique posters: *How to Handrub, How to Handwash*	Observation tools: adherence monitoring Templates for sharing adherence monitoring data with staff and leadership
	Environmental Cleaning and Disinfection		
Participate and receive feedback from onsite assessments	Slides/flipchart for healthcare worker education sessions Principles of cleaning (video)	*CDC Cleaning Strategy (Clean to Dirty)* flyer *Who Cleans What?* Flyer (customize to your facility policy)	Observation tools: adherence monitoring, fluorescent marker tool Templates for sharing adherence monitoring data with staff and leadership Environmental cleaning and disinfection responsibility assessment tool
Pre-post evaluation (distributed at workshops)			

Training and Education: Staff Training Slides / Flipchart

Environmental Cleaning and Disinfection

Personal Protective Equipment and Precautions Staff Training

THE ROLE OF HAND HYGIENE IN INFECTION PREVENTION

Objectives

- Describe strategies to prevent MDRO, the most common infections in vSNF
- List the 5 moments of hand hygiene and discuss barriers to effective hand hygiene
- Describe the importance of hand hygiene and the correct hand hygiene techniques
- Describe key points of glove use and hand hygiene
- Describe how to improve hand hygiene compliance

Why Does Transmission Occur?

- Multifactorial
  - Systems and processes of healthcare provision
  - Human behavior conditioned by many factors, including education
- **Hands of healthcare workers** are the most common mode of pathogen transmission

Transmission of Healthcare-Associated Pathogens from One Patient to Another via Healthcare Workers' Hands

Germs **present** on patient skin and immediate environmental surfaces

→

Germs **transfer** onto healthcare worker's hands

→

Germs **survive** on hands for several minutes

→

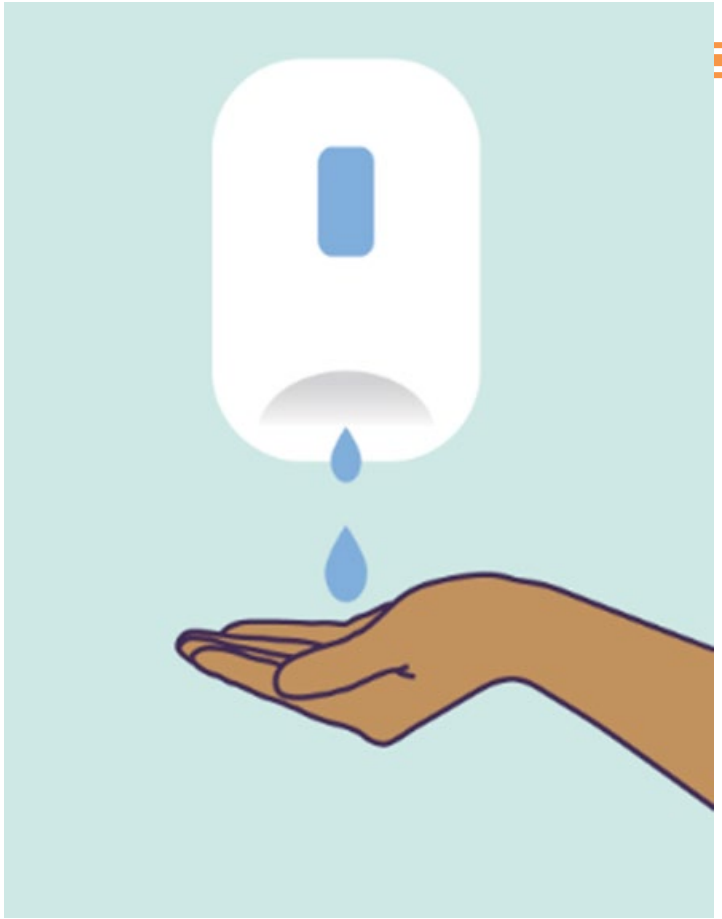
Suboptimal or omitted hand hygiene results in hands **remaining contaminated**

→

Contaminated hands **transmit** germs via direct contact with patient or patient's immediate environment

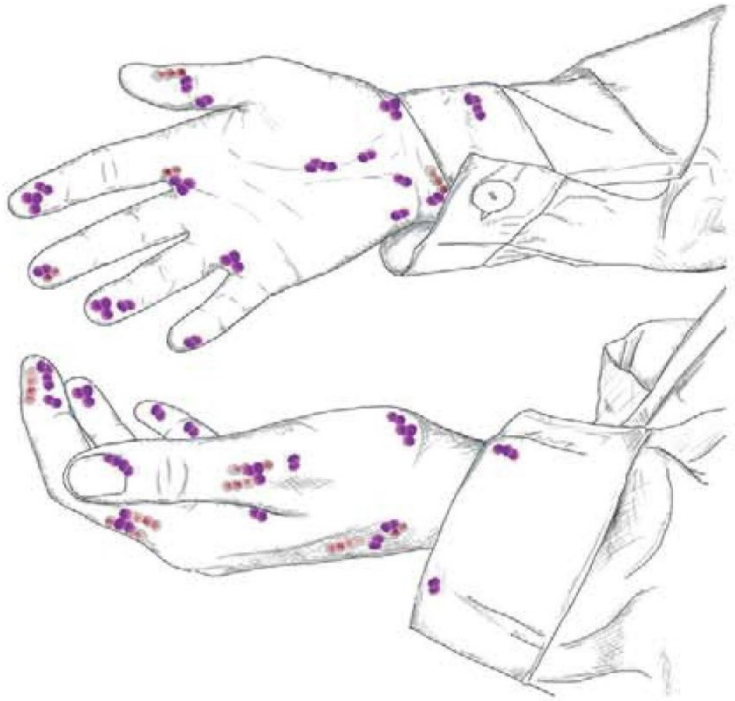
Hand Hygiene Terminology

- **Hand hygiene includes:**
  - **Handwashing:** Washing hands with plain soap and water
  - **Antiseptic hand wash:** Washing hands with water and soap containing an antiseptic agent
  - **Alcohol-based hand rub (ABHR):** Rubbing hands with an alcohol-containing agent



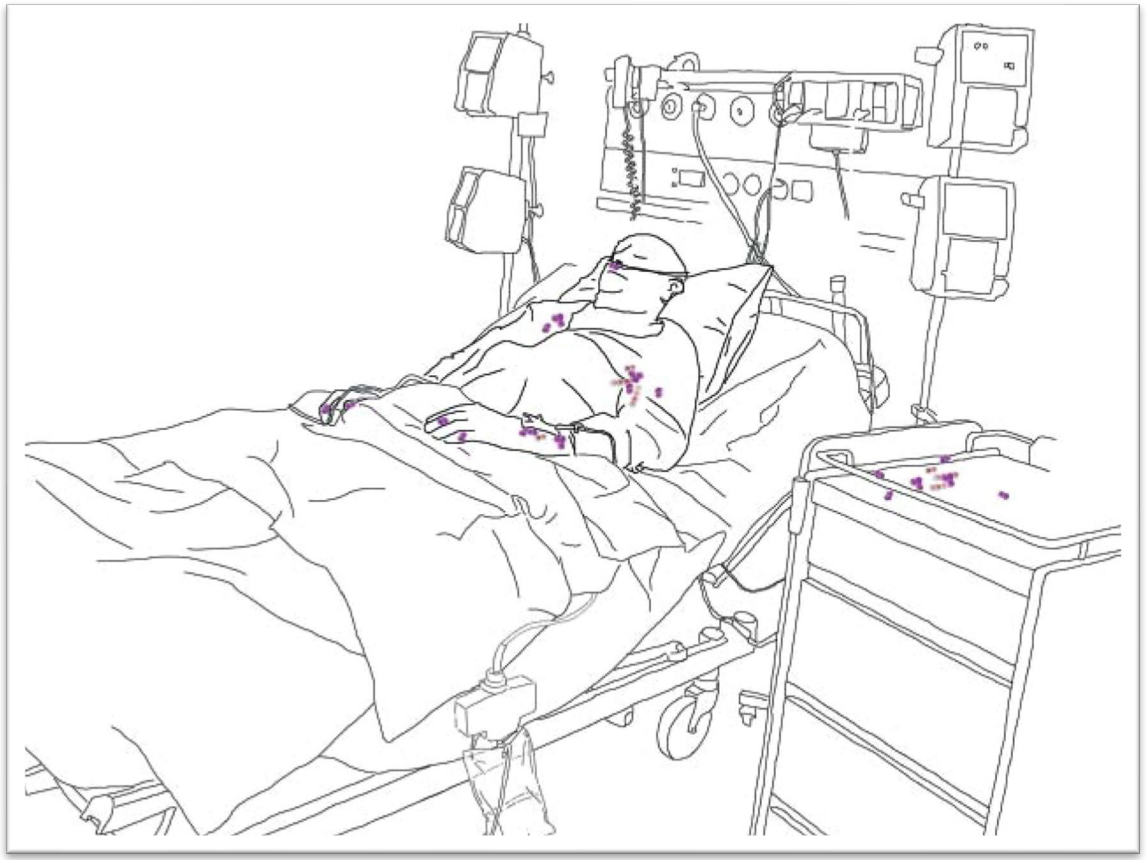
Transmission Can Occur via Healthcare Worker Hands

- Transmission is a way germs (such as viruses, bacteria, or other microbes) are moved from a person or object to another person.
- Germs don’t move themselves. Germs depend on people and the environment, including medical equipment, to move in healthcare settings.
- **Healthcare worker hands are the most common way that germs are spread.**



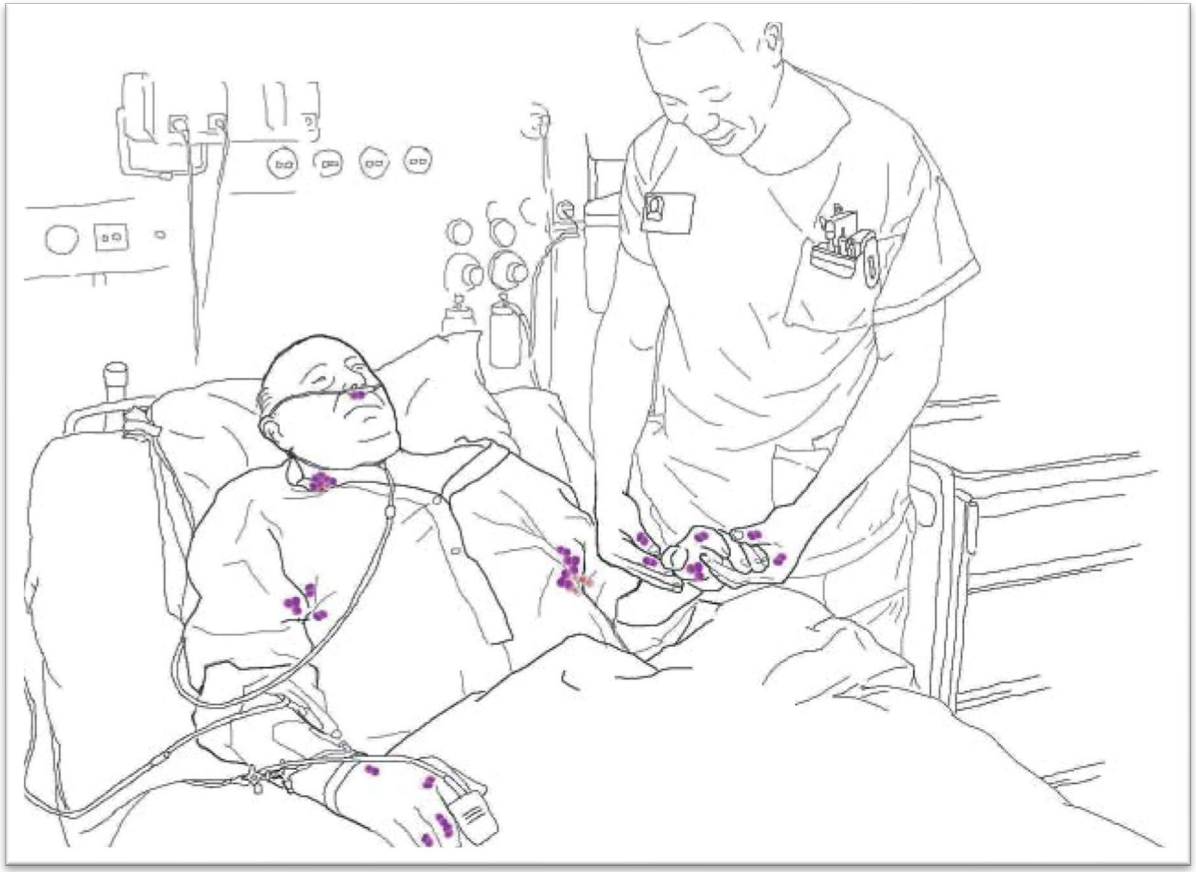
Step 1: Germs on Patient Skin and Environment

- Germs are present on patients' skin. Nearly 1 million dead skin flakes containing viable germs are shed daily from normal skin to a patient's immediate surroundings such as the bed linen and furniture.
- Surrounding patient surfaces may be contaminated by a patient's own germs or by other people's germs and by inanimate objects.



Step 2: Healthcare Worker Hand Contamination

- By direct and indirect contact, patient germs contaminate healthcare worker hands
- Healthcare worker hands become contaminated by touching germs present on patients, medical equipment, and high touch surfaces.
- Healthcare workers carry the germs on their hands and can spread germs when proper hand hygiene is not performed.

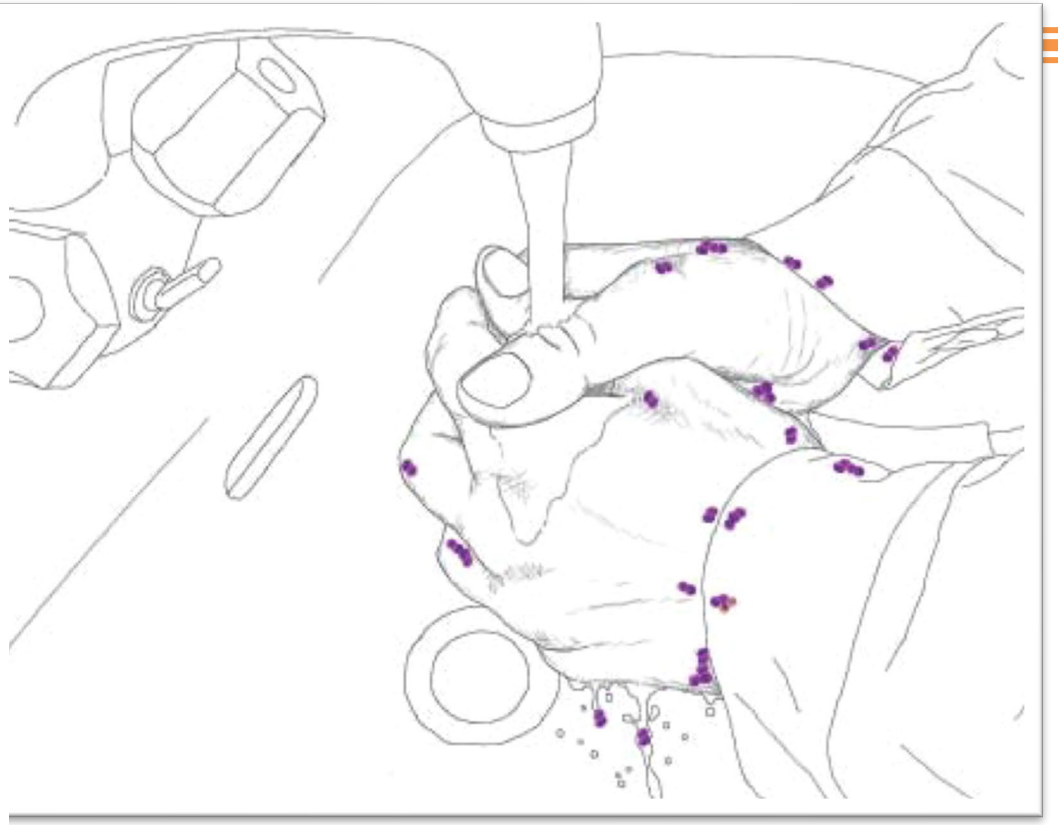


Step 3: Germs Survive and Multiply on Healthcare Worker Hands

When proper hand hygiene is not performed after contact with patients or their environment, germs can survive and increase in number on healthcare worker hands.

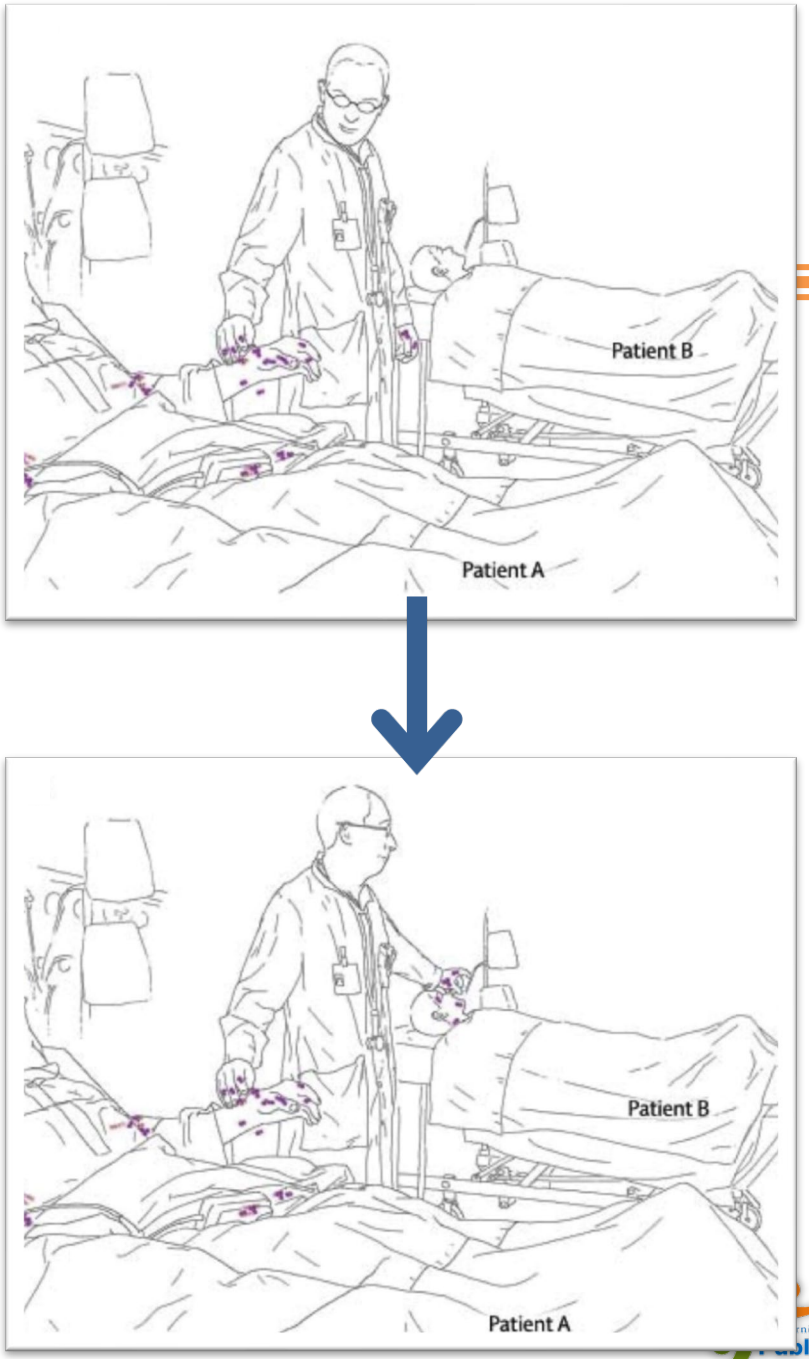
Step 4: Hands Remain Contaminated if Hand Hygiene is Missed or Poorly Performed

- When hand hygiene opportunities are missed or when hand hygiene is performed poorly, hands remain contaminated with germs.
- **Poor hand hygiene** occurs when an insufficient amount of product is used or when there is an insufficient duration of hand hygiene action.
- Transient microorganisms are still recovered on hands following handwashing with soap and water, whereas **handrubbing with an alcohol-based solution has been proven to be significantly more effective.**



Step 5: Transmission from One Patient to Another via Healthcare Worker Hands

- Transmission occurs when healthcare workers with contaminated hands come in direct contact with another patient, or with an object that may come into direct contact with a patient.
- Touching invasive devices (for example, urinary catheters, IV lines, or respiratory tubes) with contaminated hands may cause infections.



Determinants of Hand Hygiene Compliance

- **Risk factors for poor compliance:**
  - Morning and weekday shifts, being a physician, working in intensive care
- **Main reasons for non-compliance reported by healthcare workers:**
  - Too busy/time constraints, skin irritation, glove use, don't think about it
- **Other relevant obstacles in some settings:**
  - Lack of sinks, soap, paper towels or ABHR at the point of care

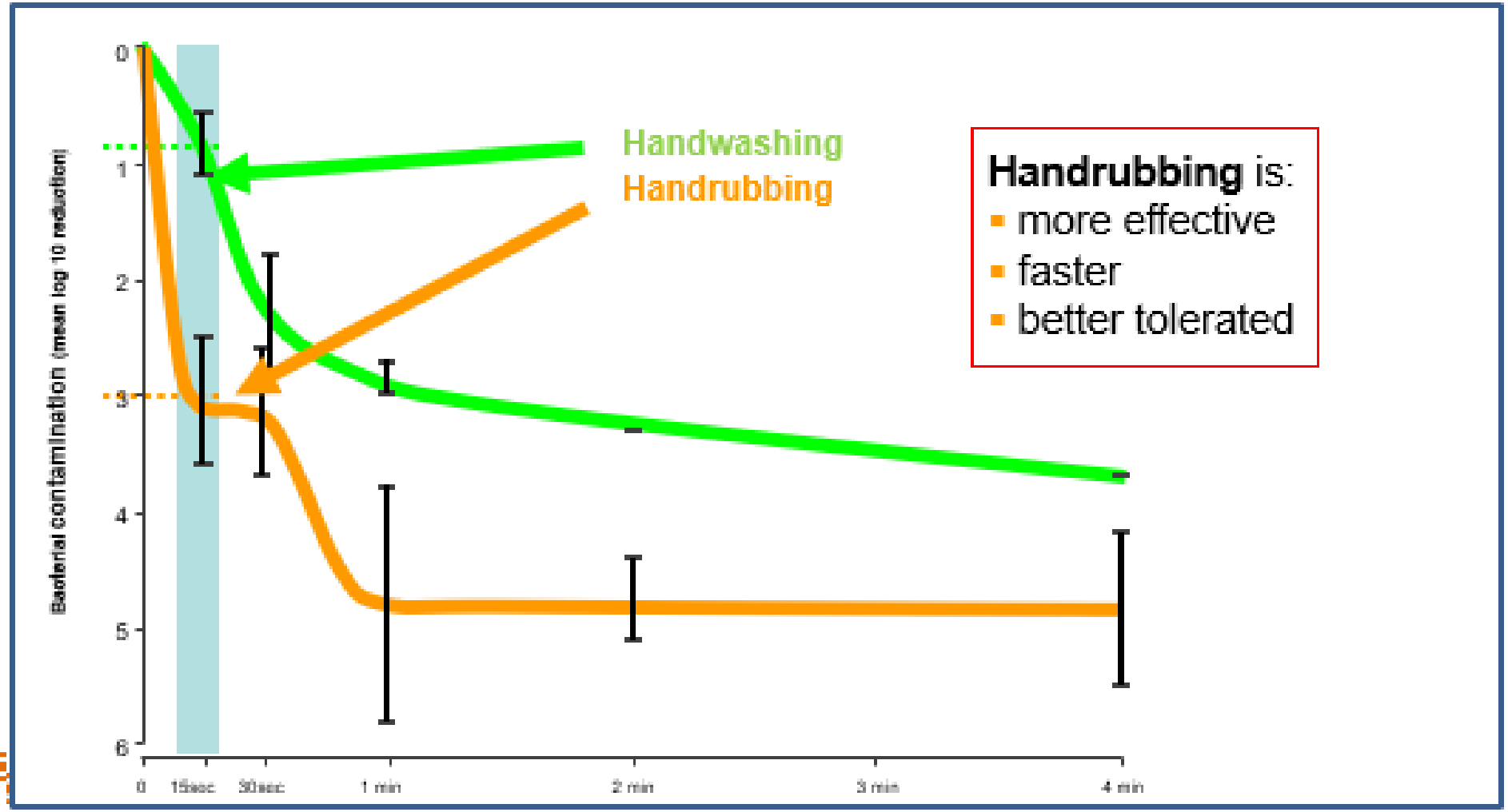
When to Hand Wash Versus Hand Rub

- **Wash hands** with soap and water when:
  - Hand are visibly soiled
  - Before and after eating
  - After toileting
- **If hands are *not* visibly soiled**, use an **ABHR** for routine decontamination of hands
- During outbreaks of certain pathogens (e.g., *C.difficile* infections, Norovirus) consider using only handwashing with soap and water

Efficacy of Hand Hygiene Products

*less effective in presence of organic material

Application Time of Hand Hygiene and Reduction of Bacterial Contamination



Pittet D and Boyce J. *Lancet Infect Dis* 2003;3:269-70.

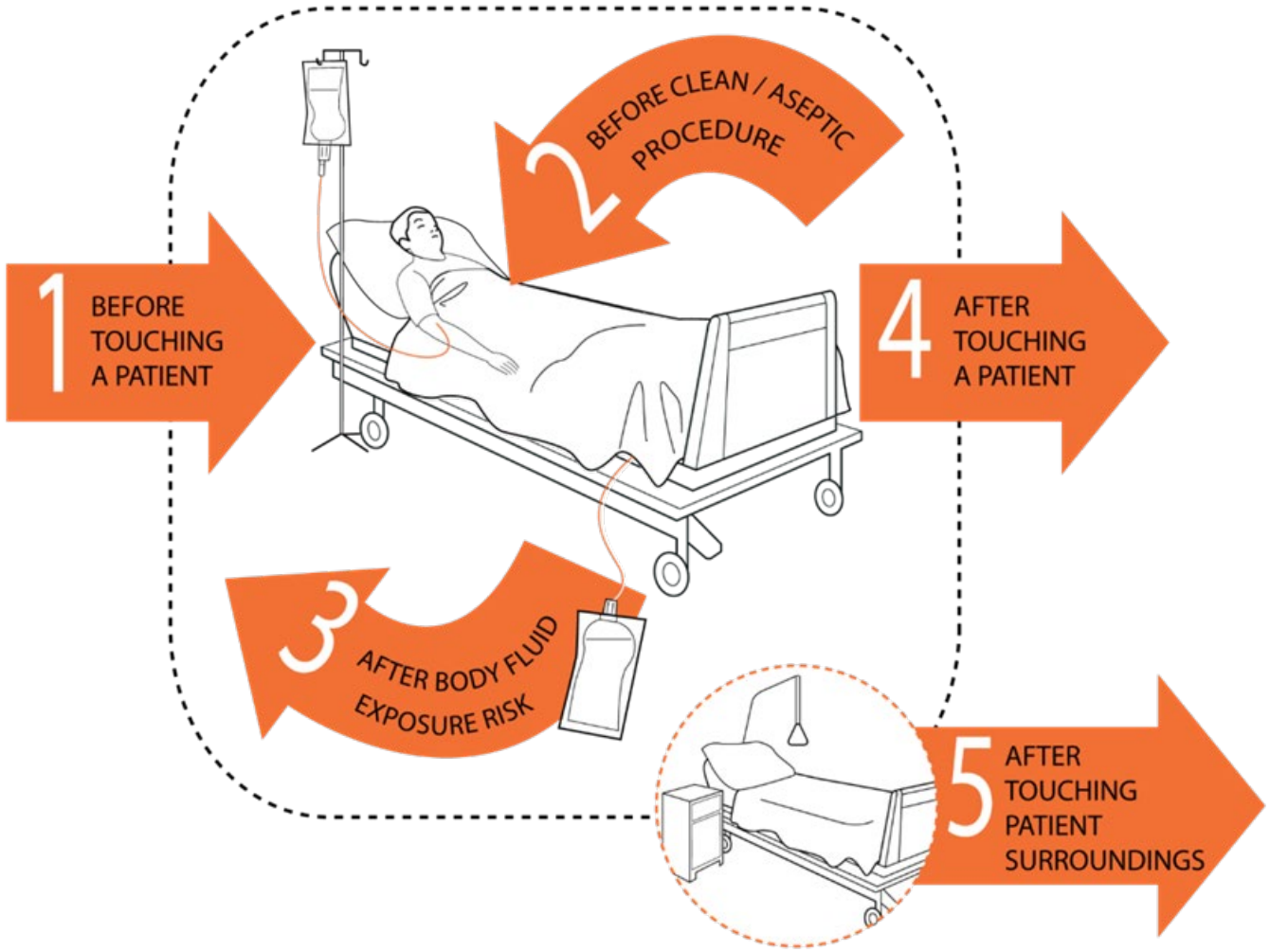
Indications for Hand Hygiene: “5 Moments”

Before

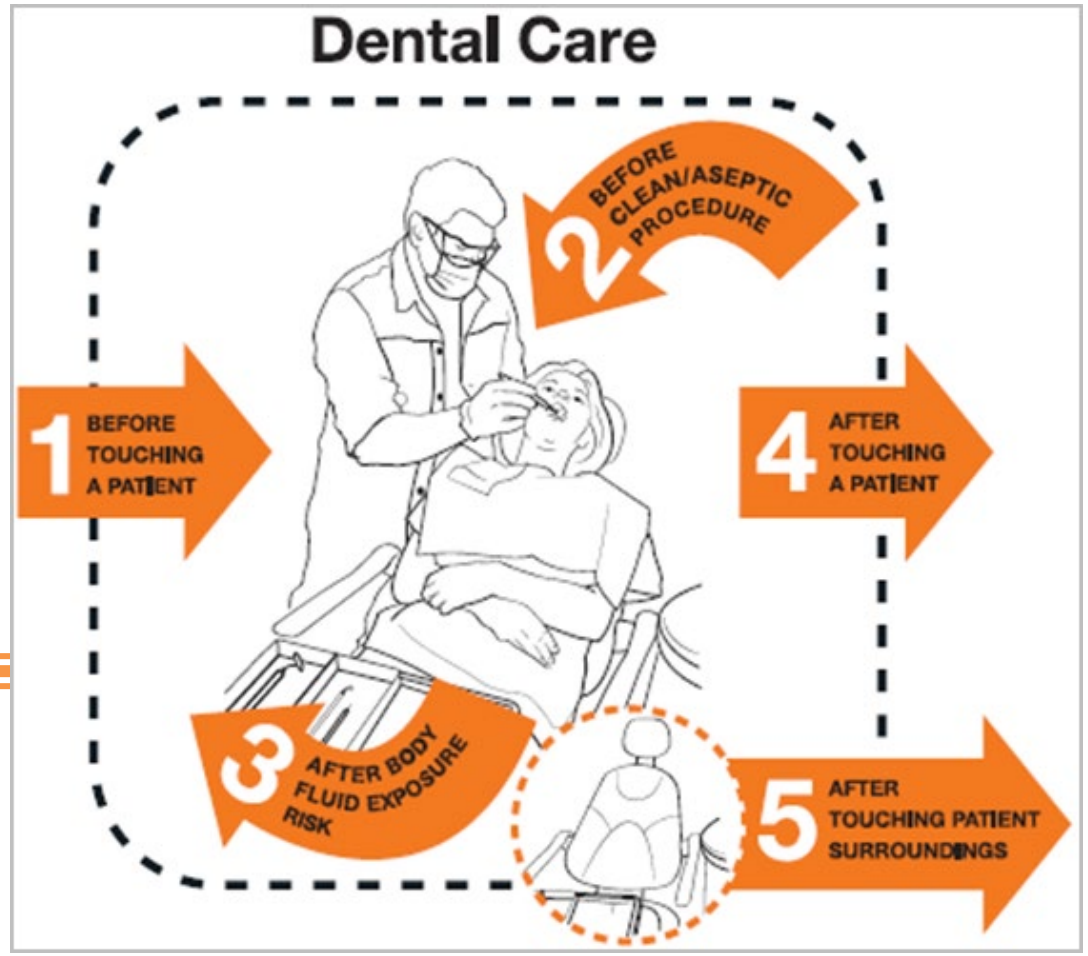
- Patient contact
- Donning gloves
- Accessing devices
- Giving medication

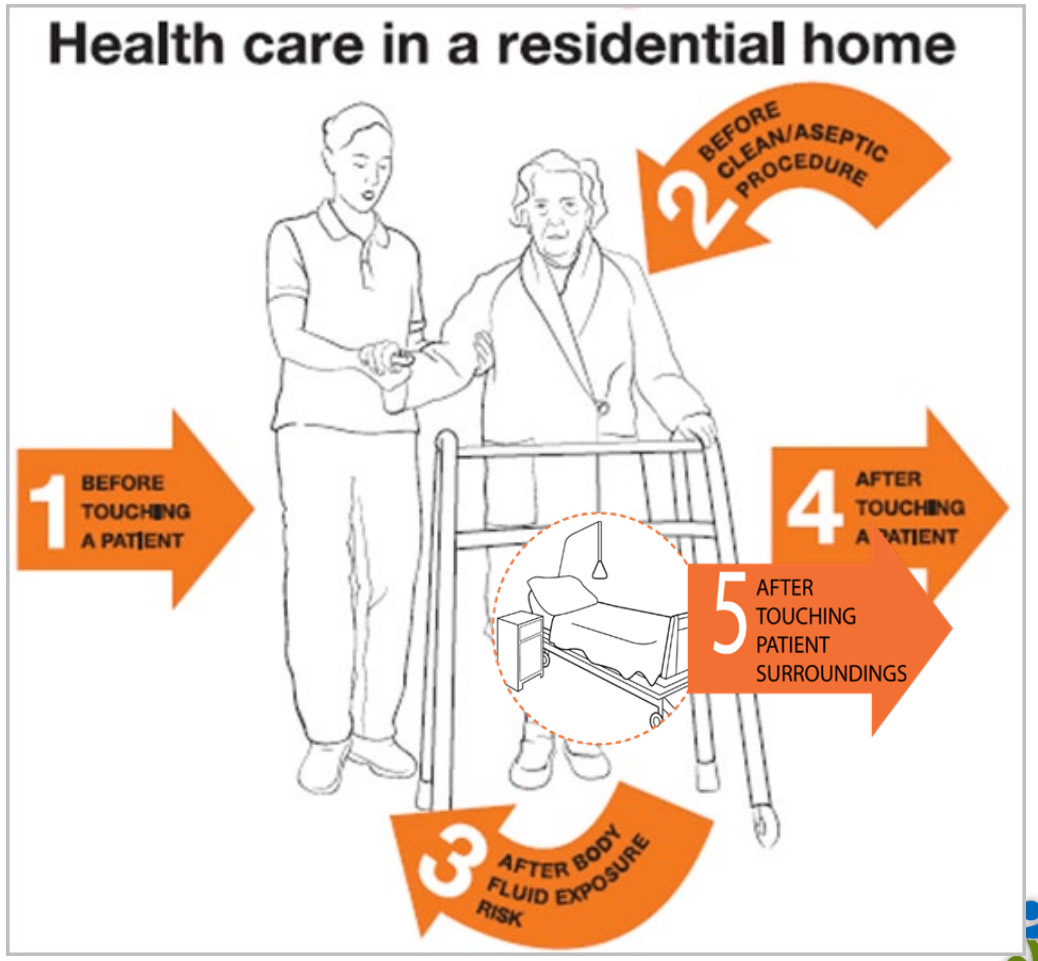
After

- Contact with a patient’s skin and/or environment
- Contact with body fluids or excretions, non-intact skin, wound dressings
- Removing gloves



Indications for Hand Hygiene Apply to Any Setting Where Healthcare Involving Direct Contact with Patients Takes Place





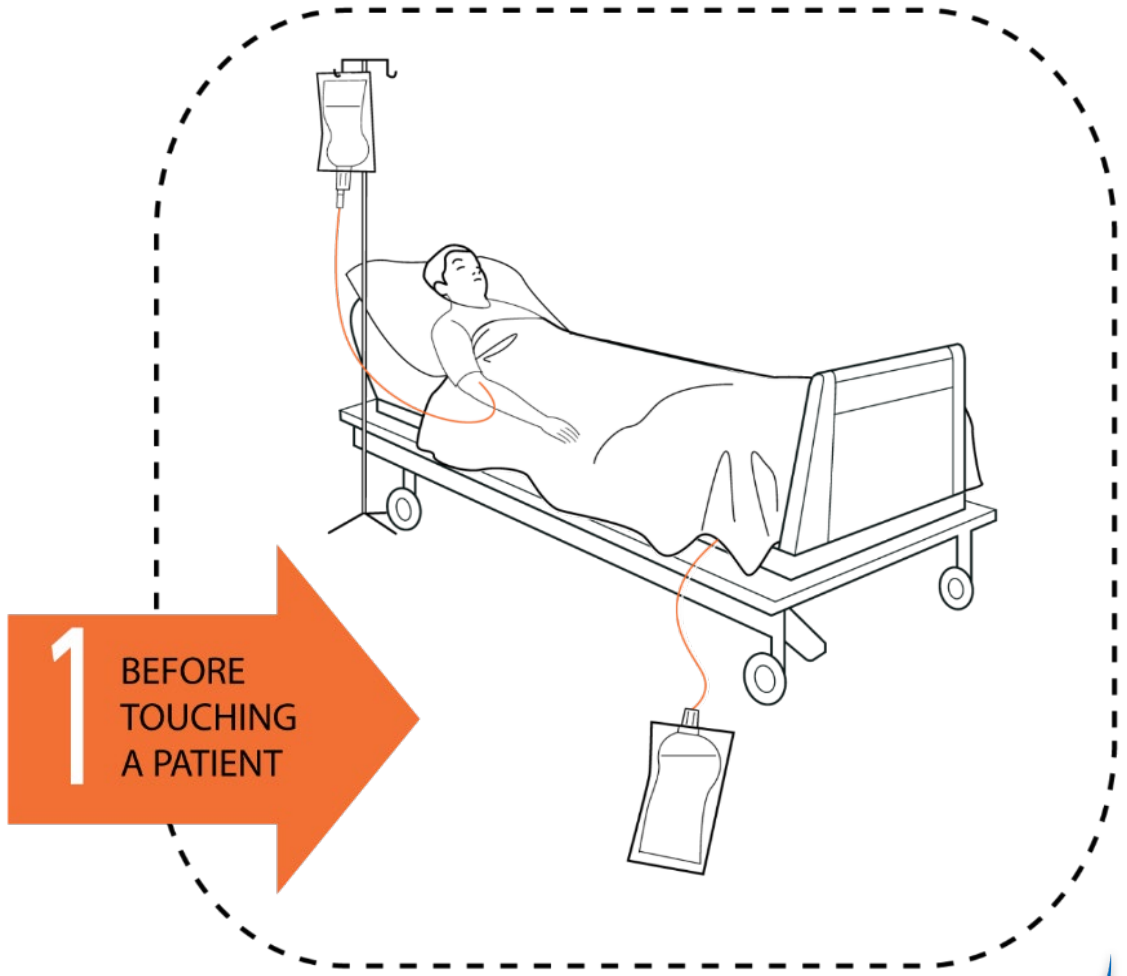
California Department of PublicHealth

Perform Hand Hygiene Before Touching a Patient

Clean your hands before touching a patient to protect them against harmful germs carried on your hands.

Examples of direct contact include:

- Shaking hands, stroking a child's forehead
- Helping a patient move around or get washed
- Applying an oxygen mask, giving physiotherapy
- Taking pulse, blood pressure, chest auscultation, abdominal palpation, recording ECG



Perform Hand Hygiene Before Clean / Aseptic Procedures

Clean your hands before accessing critical sites to protect the patient against harmful germs.

Examples of clean/aseptic procedures include:

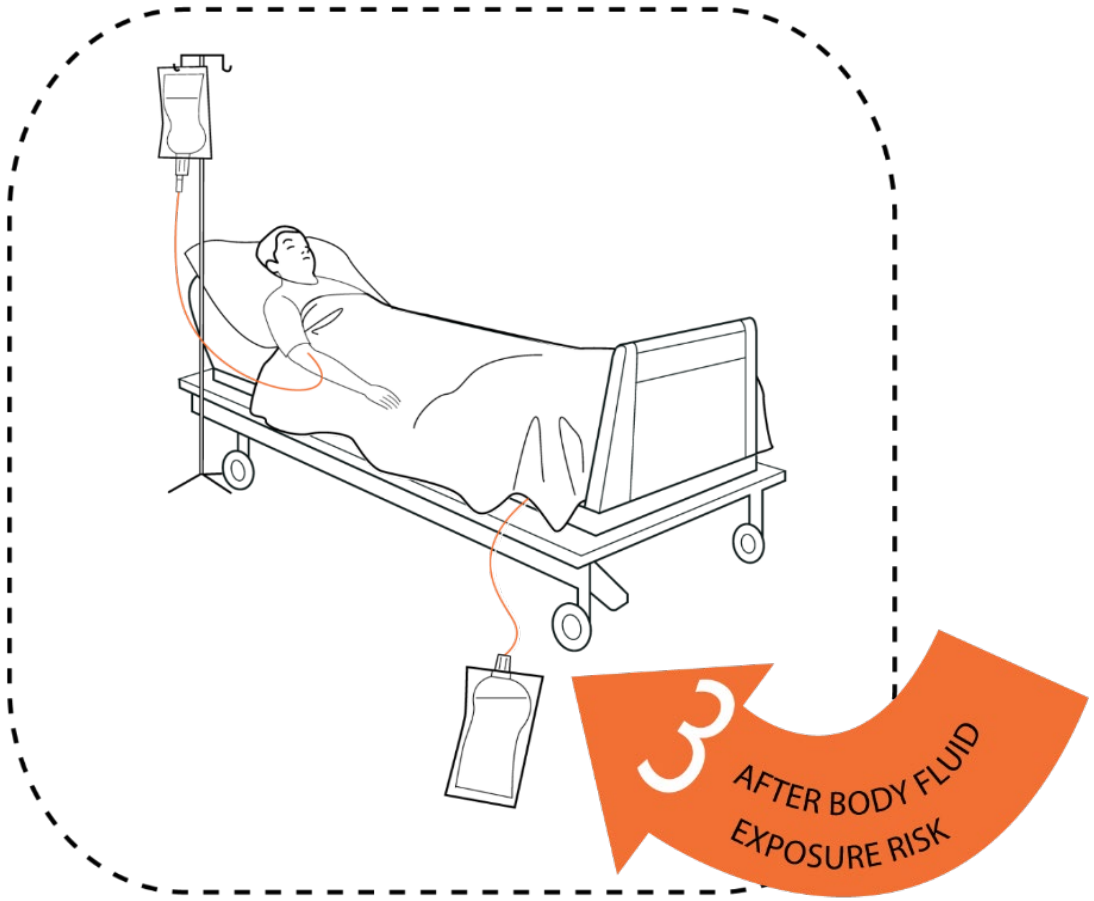
- Brushing the patient's teeth, instilling eye drops
- Skin lesion care, wound dressing, subcutaneous injection
- Catheter insertion, opening a vascular access system or a draining system, secretion aspiration
- Preparation of food, medication, pharmaceutical products, sterile material

Perform Hand Hygiene After Body Fluid Exposure Risk

Clean your hands after body fluids exposure risk to protect yourself and the healthcare environment from harmful germs.

Examples of body fluid exposure risk include:

- Brushing the patient's teeth, instilling eye drops, secretion aspiration
- Skin lesion care, wound dressing, subcutaneous injection
- Drawing and manipulating any fluid sample, opening a draining system, endotracheal tube insertion and removal
- Clearing up urine, feces, vomit; handling waste; cleaning of contaminated and visibly soiled material or areas

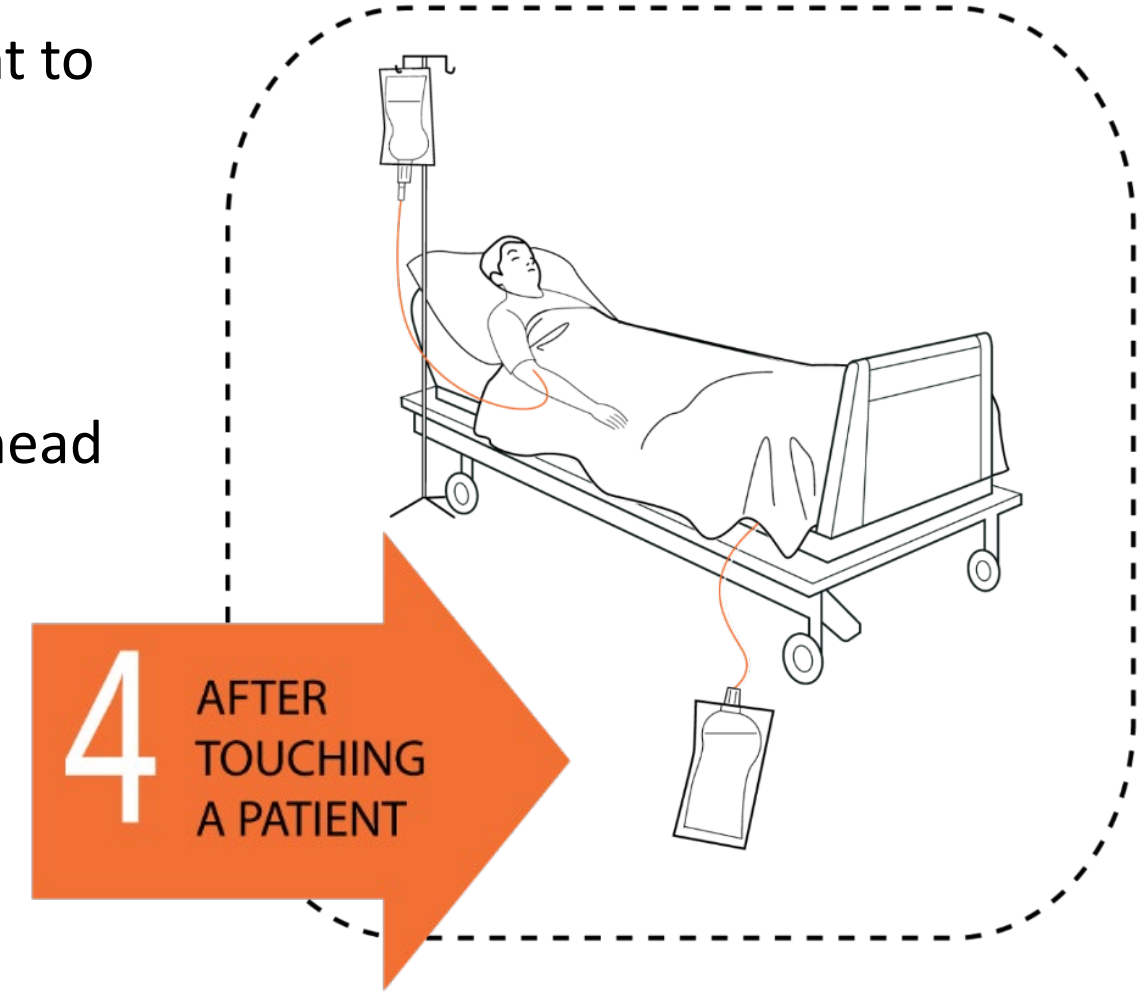


Perform Hand Hygiene After Touching a Patient

Clean your hands after touching a patient to protect yourself and the healthcare environment from harmful germs.

Examples of direct contact include:

- Shaking hands, stroking a child's forehead
- Helping a patient move around or get washed
- Applying oxygen mask, giving physiotherapy
- Taking pulse, blood pressure, chest auscultation
- Abdominal palpation, recording ECG

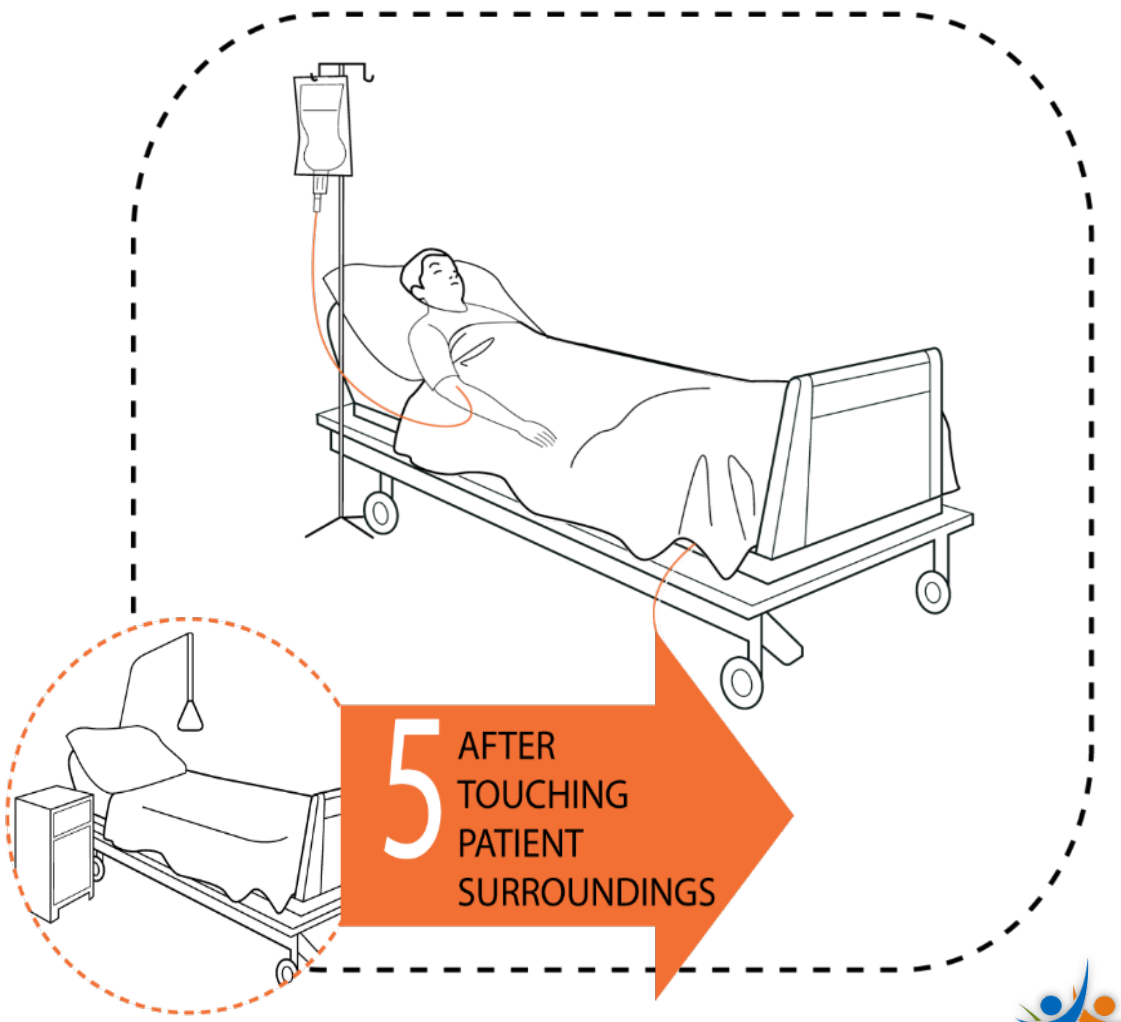


Perform Hand Hygiene After Touching Patient Surroundings

Clean your hands after touching any object or furniture in patient surroundings, even if you haven't touched the patient.

Examples of contact with patient surroundings include:

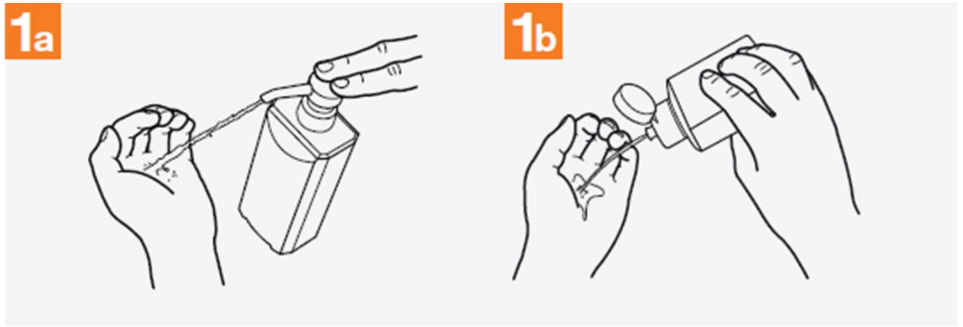
- Changing bed linen, with the patient out of the bed
- IV perfusion adjustment
- Monitoring alarm
- Holding a bed rail, leaning against the bed
- Clearing the bedside table



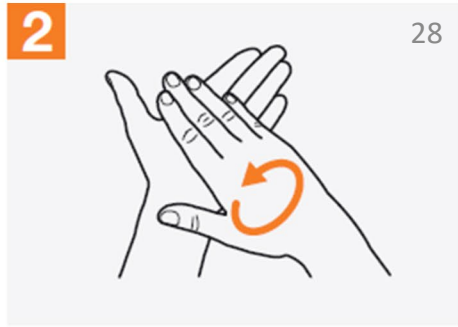
Correct Hand Hygiene Technique: How to Handrub

To effectively reduce the growth of germs on hands, handrubbing must be performed following all of the illustrated steps.

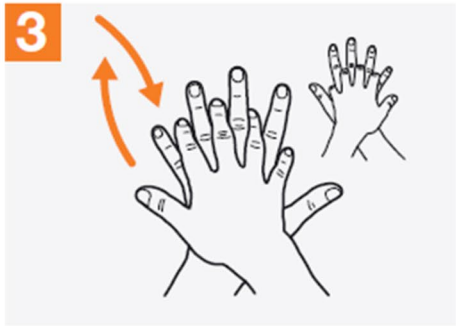
This takes 20–30 seconds.



Apply a palmful of the product in a cupped hand, covering all surfaces;



Rub hands palm to palm;



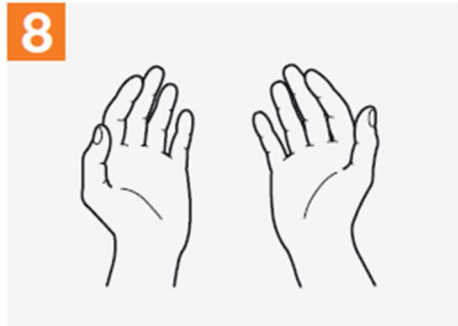
Right palm over left dorsum with interlaced fingers and vice versa;

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;



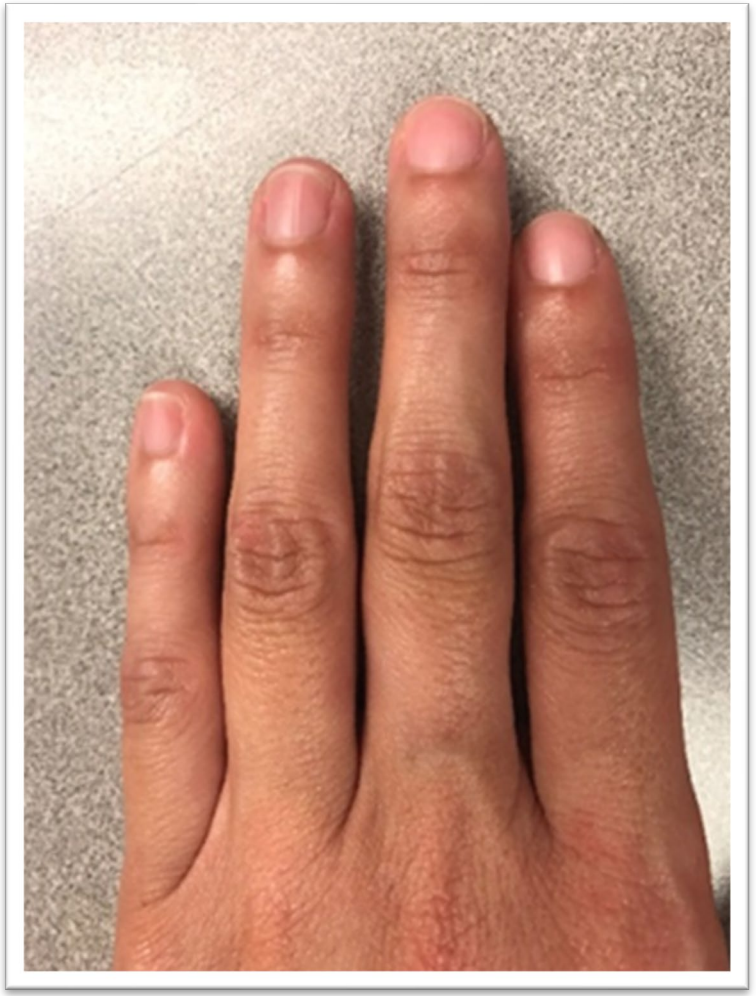
Once dry, your hands are safe.

Correct Hand Hygiene Technique: How to Handwash

To effectively reduce the growth of germs on hands, **handwashing must last 40–60 seconds** and should be performed following all of the illustrated steps.

Nails

- Artificial nails and gel polishes should **not** be worn by healthcare workers
- Polish may be worn but must be intact (not chipped)
- Nail tips should be kept to ¼ inch in length



Glove Use

- Always wear gloves when contact with blood or infectious material is possible
- Remove gloves after caring for each patient
  - Remove gloves, perform hand hygiene, and re-glove when transitioning care from a soiled to a clean area
- Do not wash gloves
- Do not reuse gloves
- Do not apply ABHR on gloves

Hand Hygiene and Glove Use

- Glove use does not replace hand hygiene
- Always perform hand hygiene before putting on and after taking off gloves
- Gloves must be removed to perform hand hygiene as required, and changed as needed

≠

How to Improve Hand Hygiene Compliance

- Make hand hygiene a facility priority
- Educate staff about hand hygiene
- Ensure competency
- Encourage patients and families to remind healthcare workers to clean their hands
- Make handrubs easily available (e.g., place at entrance to patient room, at bedside)
- Monitor adherence to hand hygiene and provide feedback to staff
  - Train/re-train secret shoppers
  - Explore electronic hand hygiene monitoring systems

Adherence Monitoring Tool: Hand Hygiene

Healthcare-Associated Infections Program Adherence Monitoring
Hand Hygiene

Assessment completed by:
Date:
Unit:

Regular monitoring with feedback of results to staff can improve hand hygiene adherence. Use this tool to identify gaps and opportunities for improvement. Monitoring may be performed in any type of patient care location.

Instructions: Observe at least 10 hand hygiene (HH) opportunities per unit. Observe a staff member and record his/her discipline. Check the type of hand hygiene opportunity you are observing. Indicate if HH was performed. Record the total number of successful HH opportunities and calculate adherence.

HH Opportunity	Discipline	What type of HH opportunity was observed? (select/ ☑ 1 per line)	Was HH performed for opportunity observed? ✓ or Ø
Example	N	☐ before care/entering room* ☐ before task ☐ after body fluids ☐ after care* ☑ upon leaving room ***Remember:** Hand hygiene should be performed before and after glove use	✓
HH1.		☐ before care/entering room ☐ before task ☐ after body fluids ☐ after care ☐ upon leaving room	
HH2.		☐ before care/entering room ☐ before task ☐ after body fluids ☐ after care ☐ upon leaving room	
HH3.		☐ before care/entering room ☐ before task ☐ after body fluids ☐ after care ☐ upon leaving room	
HH4.		☐ before care/entering room ☐ before task ☐ after body fluids ☐ after care ☐ upon leaving room	
HH5.		☐ before care/entering room ☐ before task ☐ after body fluids ☐ after care ☐ upon leaving room	
HH6.		☐ before care/entering room ☐ before task ☐ after body fluids ☐ after care ☐ upon leaving room	
HH7.		☐ before care/entering room ☐ before task ☐ after body fluids ☐ after care ☐ upon leaving room	
HH8.		☐ before care/entering room ☐ before task ☐ after body fluids ☐ after care ☐ upon leaving room	
HH9.		☐ before care/entering room ☐ before task ☐ after body fluids ☐ after care ☐ upon leaving room	
HH10.		☐ before care/entering room ☐ before task ☐ after body fluids ☐ after care ☐ upon leaving room	

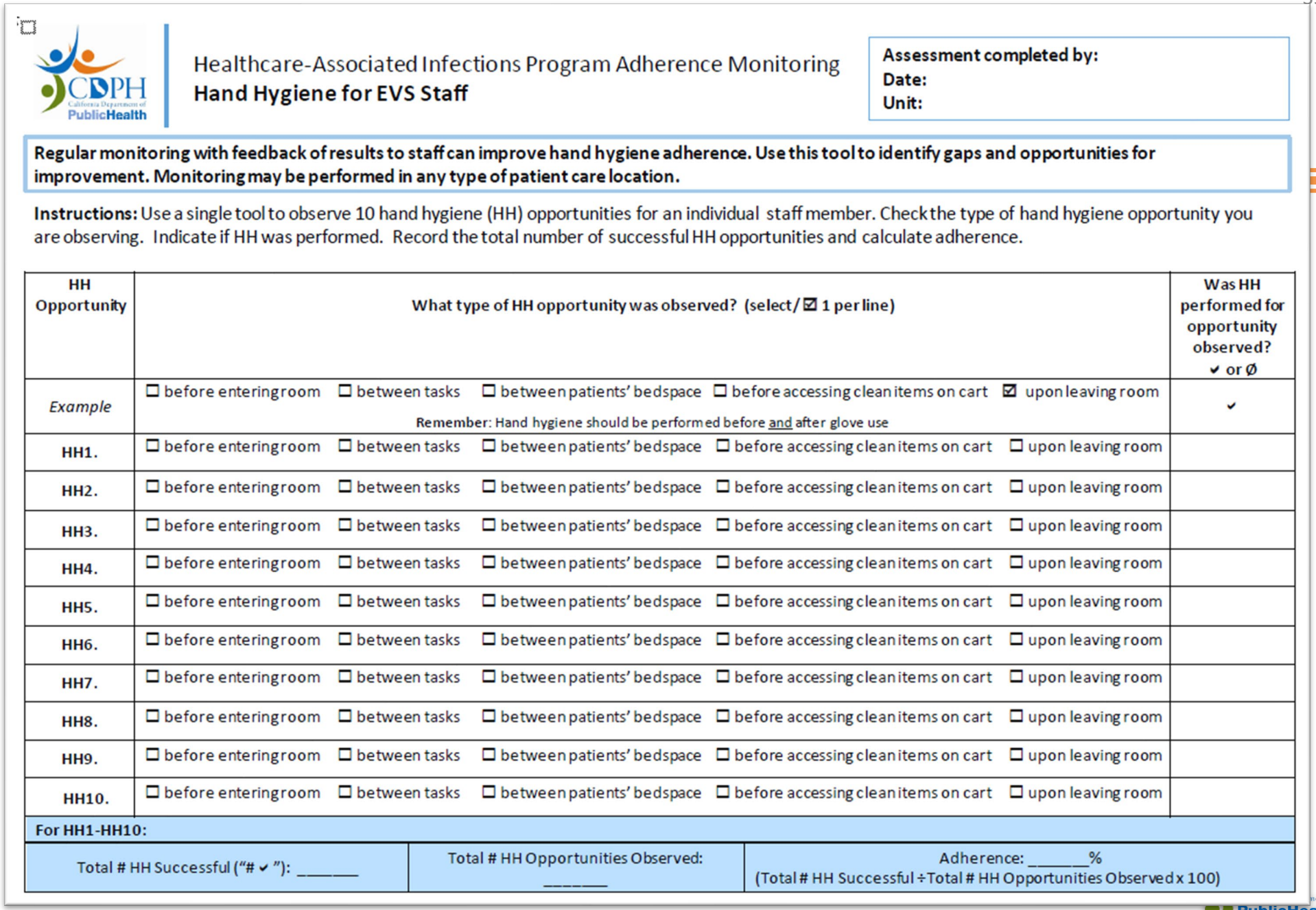
Disciplines:
CNA = Nurse Assistant
D = Dietary
N =Nurse
P = Physician
RT = Respiratory Therapist
S = Student
VIS = Visitor
VOL = Volunteer
W = Social Worker
OTH = Other, Specify
U = Unknown

Opportunities:
✓ = Opportunity Successful
Ø = Opportunity Missed

For HH1-HH10:

Total # HH Successful ("# ✓ "): _____	Total # HH Opportunities Observed: _____	Adherence: _____% (Total # HH Successful ÷ Total HH Opportunities Observed x 100)

Adherence Monitoring Tool: Hand Hygiene for EVS Staff



CDPH California Department of PublicHealth

Healthcare-Associated Infections Program Adherence Monitoring
Hand Hygiene for EVS Staff

Assessment completed by:
Date:
Unit:

Regular monitoring with feedback of results to staff can improve hand hygiene adherence. Use this tool to identify gaps and opportunities for improvement. Monitoring may be performed in any type of patient care location.

Instructions: Use a single tool to observe 10 hand hygiene (HH) opportunities for an individual staff member. Check the type of hand hygiene opportunity you are observing. Indicate if HH was performed. Record the total number of successful HH opportunities and calculate adherence.

HH Opportunity	What type of HH opportunity was observed? (select/☑ 1 per line)	Was HH performed for opportunity observed? ✔ or Ø
Example	☐ before entering room ☐ between tasks ☐ between patients' bedspace ☐ before accessing clean items on cart ☑ upon leaving room Remember: Hand hygiene should be performed before and after glove use	✔
HH1.	☐ before entering room ☐ between tasks ☐ between patients' bedspace ☐ before accessing clean items on cart ☐ upon leaving room	
HH2.	☐ before entering room ☐ between tasks ☐ between patients' bedspace ☐ before accessing clean items on cart ☐ upon leaving room	
HH3.	☐ before entering room ☐ between tasks ☐ between patients' bedspace ☐ before accessing clean items on cart ☐ upon leaving room	
HH4.	☐ before entering room ☐ between tasks ☐ between patients' bedspace ☐ before accessing clean items on cart ☐ upon leaving room	
HH5.	☐ before entering room ☐ between tasks ☐ between patients' bedspace ☐ before accessing clean items on cart ☐ upon leaving room	
HH6.	☐ before entering room ☐ between tasks ☐ between patients' bedspace ☐ before accessing clean items on cart ☐ upon leaving room	
HH7.	☐ before entering room ☐ between tasks ☐ between patients' bedspace ☐ before accessing clean items on cart ☐ upon leaving room	
HH8.	☐ before entering room ☐ between tasks ☐ between patients' bedspace ☐ before accessing clean items on cart ☐ upon leaving room	
HH9.	☐ before entering room ☐ between tasks ☐ between patients' bedspace ☐ before accessing clean items on cart ☐ upon leaving room	
HH10.	☐ before entering room ☐ between tasks ☐ between patients' bedspace ☐ before accessing clean items on cart ☐ upon leaving room	

For HH1-HH10:

Total # HH Successful ("# ✔"): _____	Total # HH Opportunities Observed: _____	Adherence: _____% (Total # HH Successful ÷ Total # HH Opportunities Observed x 100)

Establish an Adherence Monitoring Program

- Include adherence monitoring in manager performance evaluations
- Train all staff performing adherence monitoring using consistent training materials
- Make the Adherence Monitoring Program sustainable by
  - Training staff from every department
  - Require pre-determined scheduled adherence monitoring
  - Feedback results to staff, leadership, and committees
- Validate the adherence monitoring program by having different departments periodically monitor each other

Summary

- Hand hygiene reduces MDRO transmission and the incidence of healthcare-associated infections
- Remember your “5 Moments” of hand hygiene
- Follow proper technique when performing hand hygiene
- Use ABHR as the preferred method of hand hygiene

THE ROLE OF THE ENVIRONMENT IN INFECTION PREVENTION

Objectives

- Describe the role of the environment in transmitting infections
- Discuss strategies to ensure effectiveness of cleaning and disinfection
- Identify determinants for low level disinfection
- Demonstrate use of adherence monitoring tools and feedback

Role of Environmental Surfaces in Infection Transmission

Transmission of Healthcare-Associated Pathogens from Contaminated Environmental Surfaces Leads to Patient Infection

Surface must become contaminated by contact or droplet spread → Organism must survive on the surface → Surface must be touched by person or patient care item and picks up sufficient inoculum → No hand hygiene/failure of adequate environmental cleaning results in contamination of hands or surfaces → Contaminated hands/surfaces must transmit the organism to another resident in sufficient quantity to cause infection

The Inanimate Environment. , Bennett & Brachman's Hospital Infections 6th Ed. 2014
Chou. APIC Text of Infection Control & Epidemiology. 2013
HICPAC /CDC Isolation Guidelines. 2007

Multiple Factors Influence Duration of Survival

- Type of microbe
- Temperature
- Humidity

C.difficile spores are shed in high numbers, are resistant to desiccation and some disinfectants, and can live on surfaces for up to 5 months

Kramer et al. BMC Infect Dis. 2006

Admission to a Room Previously Occupied by a Colonized or Infected Patient is a Significant Risk Factor for Infection

- *C.difficile* acquisition
  - 11% of patients admitted to an ICU room previously occupied by a CDI patient developed CDI
  - 4.6% of patients admitted to a room without a prior CDI positive occupant developed CDI
- Other pathogens
  - Patients have an average of a 120% increased risk of acquisition from prior infected room occupants

Revisiting Environmental Hygiene and Hospital-Acquired Infections (PDF) (www.idse.net/download/HAI_IDSE13_WM.pdf)
Weber DJ et.al. AJIC 2013
Shaughnessy et al. Infect Contr Hosp Epidemiol. 2011

Effective Cleaning Strategies

Terminology

- **Cleaning** is the removal of visible soil (e.g., organic and inorganic material) from objects and surfaces.
- **Disinfection** removes most germs present on surfaces that can cause infection or disease.

Surfaces must be cleaned in order to be disinfected.

Cleaning Process

- Select PPE as required
- Change gloves and perform hand hygiene as required
- Disinfect (or clean) environmental surfaces on a regular basis (for example, daily, three times per week) and when surfaces are visibly soiled.
- Communicate issues to your supervisors

Follow a Standard Process for Cleaning that Ensures Consistency and Prevents Contamination

- Work around the room in the same direction every time
- Start from the highest surfaces and work down
- Always move from clean areas to dirty areas, for example, clean the patient room first before the bathroom

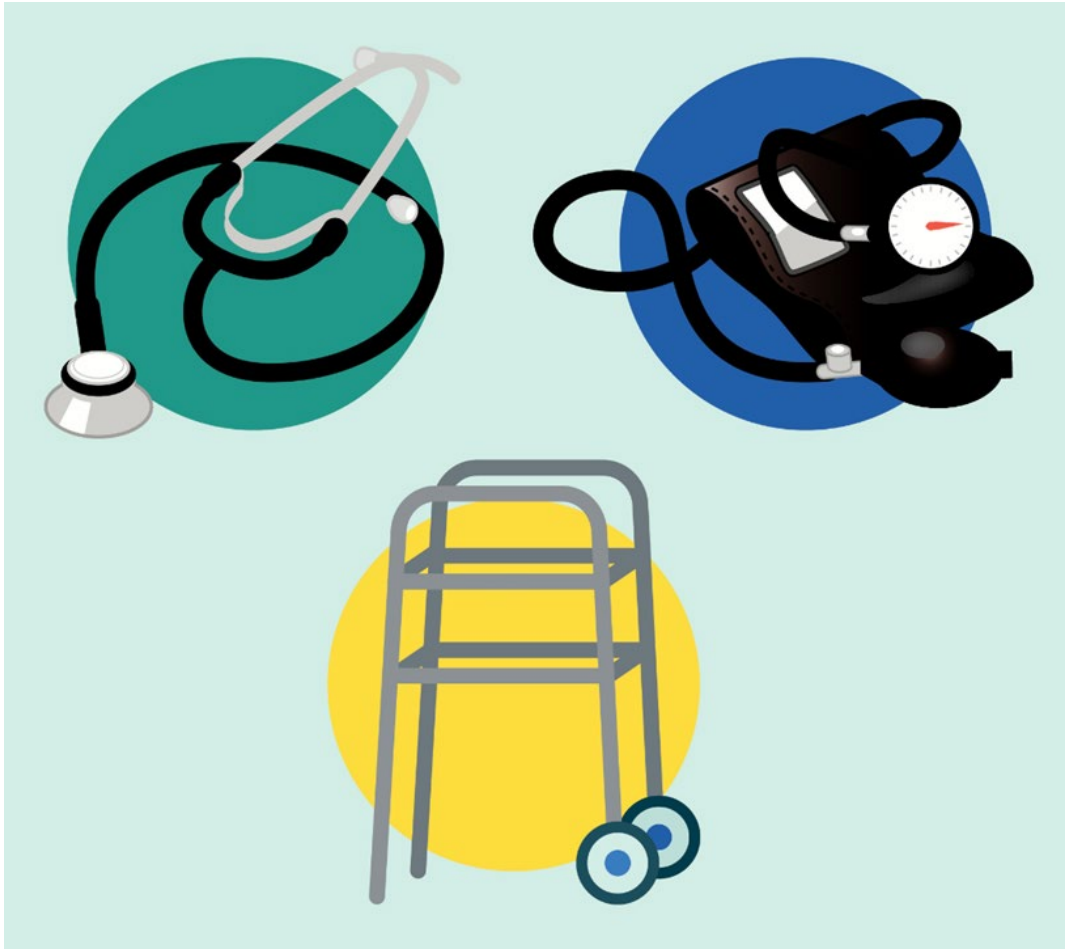
Perform at Least Daily Cleaning / Disinfection on Surfaces Likely to Be Contaminated (High Touch Surfaces)

- Include a list of high touch surfaces and equipment in your cleaning and disinfection policy.
- Examples of high touch surfaces include:
  - ❑ Doorknobs or door handles
  - ❑ Light switches
  - ❑ Bedpan cleaners
  - ❑ Bedrail
  - ❑ Call bell
  - ❑ TV remote
  - ❑ IV pump
  - ❑ Computer keyboard
  - ❑ IV poles

See example list in CDC Environmental Cleaning Toolkit (www.cdc.gov/hai/toolkits/Evaluating-Environmental-Cleaning.html)

Everyone is Responsible for Environmental Cleaning and Disinfection

- Everyone has a role in environmental cleaning and disinfection. Make sure you know who is responsible for cleaning particular items in the patient room.
- Clean medical equipment and disinfect shared medical equipment after each patient use / prior to use with another resident.
- Ensure appropriate cleaning and disinfectant products are easily accessed at points of use.



Use Cleaning Equipment in a Manner to Prevent Contamination

- Change cleaning cloths as needed
- Use separate cleaning cloths for each patient area in multi-bed rooms
- Use separate cloths for bathroom and patient's room
- Use the toilet brush to clean inside the toilet bowl only
- Clean and disinfect the cart and equipment routinely and after cleaning isolation rooms
- Change gloves and perform hand hygiene as required

Reduce Bioburden for Effective Cleaning

- Clean visible soil in order for disinfectant to be effective
- Clean and disinfect high-touch surfaces daily
- Clean and disinfect rooms thoroughly after discharge of patients
- Clean and disinfect portable equipment
- Follow proper cleaning and disinfection practices at all times

Detergents and Disinfectants

- Detergent
  - Used for cleaning
  - Contains surfactants, lifts dirt
  - Can become easily contaminated; **does not kill microorganisms**
  - Less toxic, generally less odor, less costly than disinfectant
- Disinfectant
  - Inhibits growth or kills microorganisms
  - More toxic, more costly than detergent

EPA Label Claim for Disinfectant

- Clarifies manufacturer's instructions for use
- **Wet contact time** is the time required for a disinfectant to kill microorganisms on a pre-cleaned surface
- The EPA label claim states if the product is
  - Virucidal
  - Bactericidal
  - Tuberculocidal
  - Fungicidal
  - Sporicidal

Disinfectant Selection

Disinfectant	Strengths	Concerns
Quaternary Ammonium Products (Quats)	• Widely used • Bactericidal, fungicidal, virucidal • Hospital-grade quats tuberculocidal • Safe for computer keyboards	• Hard water can reduce effectiveness • Generally not sporicidal • Occupational asthma documented
Phenolics	• Bactericidal, virucidal, fungicidal, tuberculocidal • Not sporicidal	• Absorbed by porous materials • Can irritate tissue • Unsafe for use in nurseries
Chlorine-based	• Broad antimicrobial activity • Does not leave toxic residues • Inexpensive • Fast acting • Removes dried organisms, biofilms	• Can cause eye irritation, gastric burns • Inactivated by organic matter • Discolors fabrics • Wet contact time 10 minutes • Corrosive in high concentrations • Can release toxic chlorine gas when mixed with ammonia
Hydrogen peroxide, Accelerated H_2O_2	• Effective • Bactericidal, virucidal at 30- 60 sec • Fungicidal at 10 min • Low EPA toxicity rating	• Expensive

Why Bleach for *C. difficile*?

- *C. difficile* spores are difficult to kill and adhere to environmental surfaces for extended periods
- Use of a 1:10 dilution of bleach (500 ppm) for cleaning
  - Reduces surface contamination
  - Instrumental in outbreak control

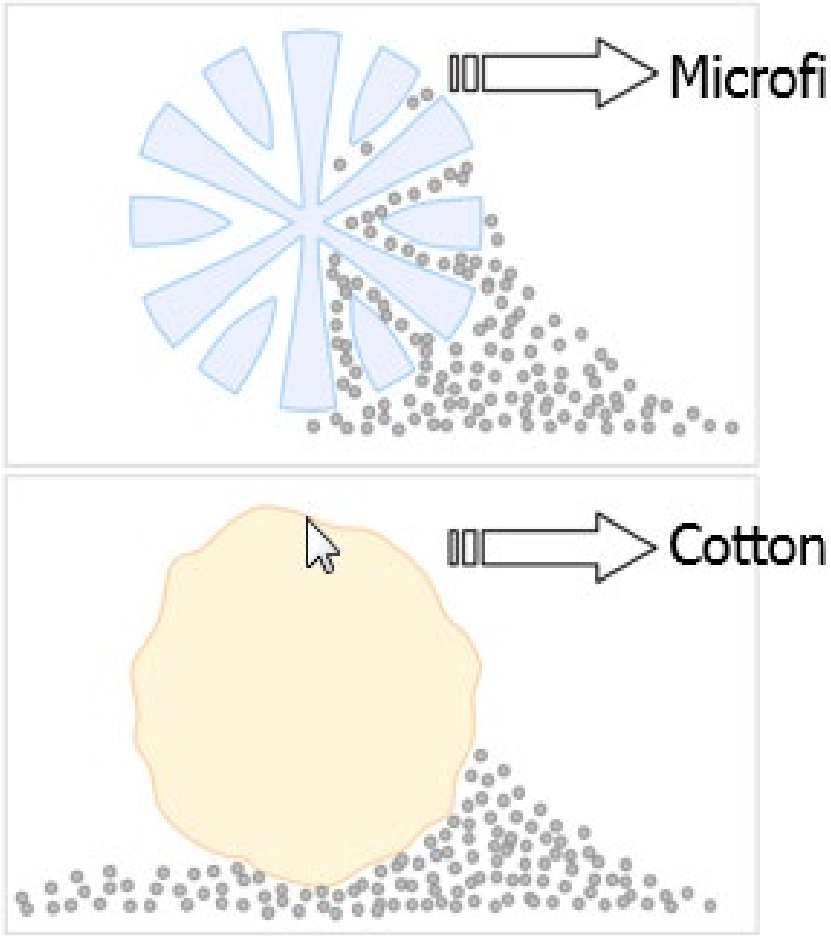
Note: Alternatives to bleach are available.

For EPA-approved disinfectants with label claims for killing *C. difficile* spores (www.epa.gov/oppad001/chemregindex.htm)

Hota. CID. 2004.
CDC. MMWR. Dec 19, 2003
Rutala et al. Clinical Micro

Microfiber vs. Cotton

- Microfiber is comprised of densely constructed synthetic strands
- Microfiber cleans 50% better than comparable cotton
  - Attracts dust
  - Easier to use, lighter
  - Designed for repeat usage
- UC Davis study found microfiber was initially more expensive than cotton, but cleaned better, used less water and chemicals, and decreased labor costs.



UC Davis Case Study. Nov 2002; Trajtman. AJIC. 2015; Smith. J Hosp Infect. 2011; HICPAC/CDC 2008

Cleaning Porous Surfaces

- Fabric
  - Vacuum regularly and re-cover when worn
  - Organic material and excess liquid should be extracted as much as possible
- Carpets
  - Steam cleaning is recommended as appropriate
  - Allow to dry for 72 hours to prevent growth of fungi
- No epidemiological evidence to show that pathogens found on fabric are linked to increased risk of HAIs

MMWR. 2003
Chou . APIC Text of Infection Control and Epidemiology. 2013

Linen

- New laundry technologies allow linen washing without requirements for hot water and chlorines
  - Hot water: 160°F x 25 minutes
  - Cold water: 71-77°F with 125ppm chlorine bleach rinse
  - Detergents not required to have stated antimicrobial claims
    - Follow manufacture's instructions for use

CDC Guidelines for Environmental Infection Control in Health-Care Facilities (PDF)
(www.cdc.gov/infectioncontrol/pdf/guidelines/environmental-guidelines-P.pdf)
Title 22, Division 5, Chapter 1, Article 8 §70825. Laundry Service
(govt.westlaw.com/calregs/Document)

Bedside Curtains

- Bacteria and fungi can survive on polyester, cotton, wool, and other fabrics
- Privacy curtains are considered high-touch surfaces and can become rapidly contaminated especially when used in Transmission-based precautions isolation rooms
- Hands can become contaminated after handling curtains
  - Study found 50% of hands contaminated after handling curtains

Divider curtains and infection risk (PDF)
(www.inspq.qc.ca/pdf/publications/1729_NoticeRecommCINQ_DividCurtainsInfectRisk.pdf)
Ohl et.al. Am J Infect Control. 2012
Koca et.al. Eurasian J Med. 2012

Floors and Carpets

- Non-carpeted floors
  - Disinfection of floors offers no advantage over regular detergent and water cleaning
- Carpets
  - Evidence linking carpets to HAI rates is limited; no recommendation against carpet use
  - Carpets have been shown to become contaminated
  - Vacuuming and steam cleaning temporarily reduces the number of organisms

CDC. MMWR. June 6, 2003
The Inanimate Environment, Bennett & Brachman's Hospital Infections 6th Ed. 2014

Effective Cleaning and Disinfection Programs

Cleaning Responsibility

- Define responsibility and frequency for cleaning and disinfecting patient care equipment and surfaces (*who cleans what* list)
- **All personnel are responsible** for cleaning the environment
  - Nursing services
  - Environmental services
  - Physical therapy
  - Respiratory therapy
- Put individual responsibilities into **policy**; assign responsibilities with **checklist**
- **All personnel must be oriented** to proper cleaning methods

Allotted Cleaning Times

- **Proper cleaning requires adequate time**
  - **Daily** cleaning can take **20-25 minutes** per room
  - **Terminal/deep** cleaning will take **40-45** minutes or longer
- **Create an individualized benchmark time** for the facility based on time needed to expediently complete a checklist of items to be cleaned and disinfected
  - Input from front line staff is essential
  - Consider room size, amount of equipment, furniture and clutter that need to be cleaned or cleaned around
  - Disseminate information to all nursing units

Association for the Health Care Environment
(www.ahe.org/ahe/learn/press_releases/2009/20090924_minimal_time_guidelines.html)

Monitoring the Thoroughness of Cleaning

How Do You Know a Patient Room is Clean?

- Appears **visually** clean or finger-swipe clean
  - Fast and inexpensive, but lacks objectivity
- Confirmed via **technology**
  - **Fluorescence:** Environmentally stable marker is visible to UV light if still present after cleaning
  - **Adenosine Triphosphate** (**ATP**) monitoring: Measures residual organic matter left on a surface after cleaning

CDC Options for Evaluating Environmental Cleaning
(www.cdc.gov/hai/toolkits/Evaluating-Environmental-Cleaning.html)
Lillis. ATP Testing: A Proven Method to Measure Cleanliness. 2015

Monitoring Quality of Environmental Cleaning

- Develop an auditing & feedback program
  - Direct observation to evaluate use of appropriate products and procedures
  - Evaluate consistency of cleaning by use of fluorescent gel markings
  - Record and summarize data routinely (e.g. monthly or quarterly)
  - Provide feedback to EVS/housekeeping staff

Monitoring Cleaning

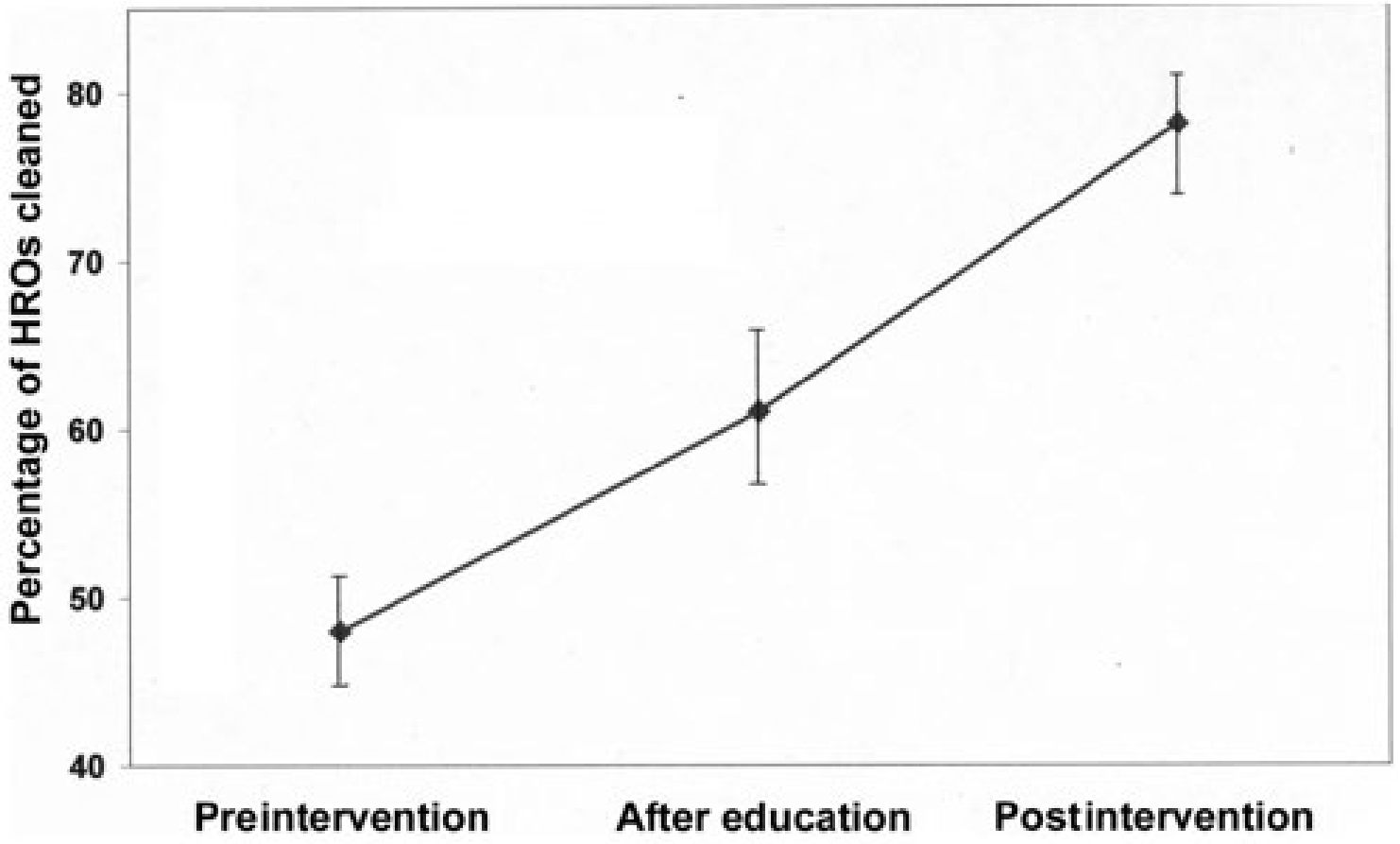
Comparison of Methods			
	Visual	**Fluorescence**	**ATP**
1. What is measured?	impression of cleanliness	whether fluorescent residual has been removed	biological matter remaining on surface after cleaning
2. Can it be used by persons of differing skill levels?	no technical training required	some technical training needed	some technical training needed
3. How objective is the method? (Can results be changed to appear more positive?)	can be subjective	objective, but marks could have been removed prior to reading	very objective
4. Can the amount of time spent on monitoring be minimized?	yes	room must be pre-marked and read after cleaning	yes

Monitoring Cleaning (continued)

Comparison of Methods			
	Visual	**Fluorescence**	**ATP**
5. How are results presented?	pass/fail	pass/fail	numeric value
6. Is software needed for the monitoring process?	no	can be used, but not required	yes
7. How well can it be used for a training tool?	results immediate with visual cues	results immediate with visual cues	results delayed, no visual cues usually available from surface
8. How affordable is the method?	no monetary investment	materials inexpensive; if formal program including staff education purchased, expenses will be higher	cost of machine and swabs is substantial

Does Monitoring Improve Cleaning?

- In 36 hospitals, mean percentage of high-risk objects cleaned:
  - 48% **prior** to intervention
  - 78% **after** intervention



Carling. ICHE. 2008

Adherence Monitoring Tool: Environmental Cleaning and Disinfection

CDPH California Department of PublicHealth

Healthcare-Associated Infections Program Adherence Monitoring
Environmental Cleaning and Disinfection

Assessment completed by:
Date:
Unit:

Regular monitoring with feedback of results to staff can maintain or improve adherence to environmental cleaning practices. Use this tool to identify gaps and opportunities for improvement. Monitoring may be performed in any type of patient care location.

Instructions: Observe at least two (2) different environmental services (EVS) staff members. Observe each practice and check a box if adherent ("Yes") or not adherent ("No"). In the right column, record the total number of "Yes" responses for adherent practices observed and the total number of observations ("Yes" + "No"). Calculate adherence percentage in the last row.

	Environmental Cleaning Practices	EVS Staff 1	EVS Staff 2	EVS Staff 3	Adherence by Task # Yes	Adherence by Task # Observed
ES1.	Detergent/disinfectant solution is mixed and stored according to manufacturer's instructions.	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No		
ES2.	Solution remains in wet contact with surfaces according to manufacturer's instructions.	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No		
ES3.	Cleaning process avoids contamination of solutions and cleaning tools; a clean cloth is used in each patient area, and the cloth is changed when visibly soiled.	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No		
ES4.	Standard cleaning protocol is followed to avoid cross-contamination *(e.g. from top to bottom, patient room to bathroom, and clean to dirty)*	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No		
ES5.	Environmental Services staff use appropriate personal protective equipment *(e.g. Gowns and gloves are used for patients/residents on contact precautions upon entry to the Contact precautions room.)*	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No		
ES6.	Hand hygiene is performed throughout the cleaning process as needed, including before and after glove use.	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No		
ES7.	High-touch surfaces* are thoroughly cleaned and disinfected after each patient. *Mark "Yes" if Fluorescent Marker Assessment Tool result is 100%; mark "No" if <100%.*	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No		
ES8.	There are no visible tears or damage on environmental surfaces or equipment.	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No		
ES9.	The room is clean, dust free, and uncluttered.	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No		

***Examples of high touch surfaces:**

Bed rail	Chair	Room light switch	TV remote	Bathroom door knob/handle	Bathroom sink
Tray table	In-room medical cart	IV pole ("grab area")	Room inner door knob/handle	Bathroom handrail	Bathroom faucet
Side table	Room sink	Call button	In-room cabinet	Bathroom light switch	Toilet flush handle
Side table handle	Room sink faucet	PPE container	In-room computer/keyboard	Toilet seat	Toilet/bedpan cleaner

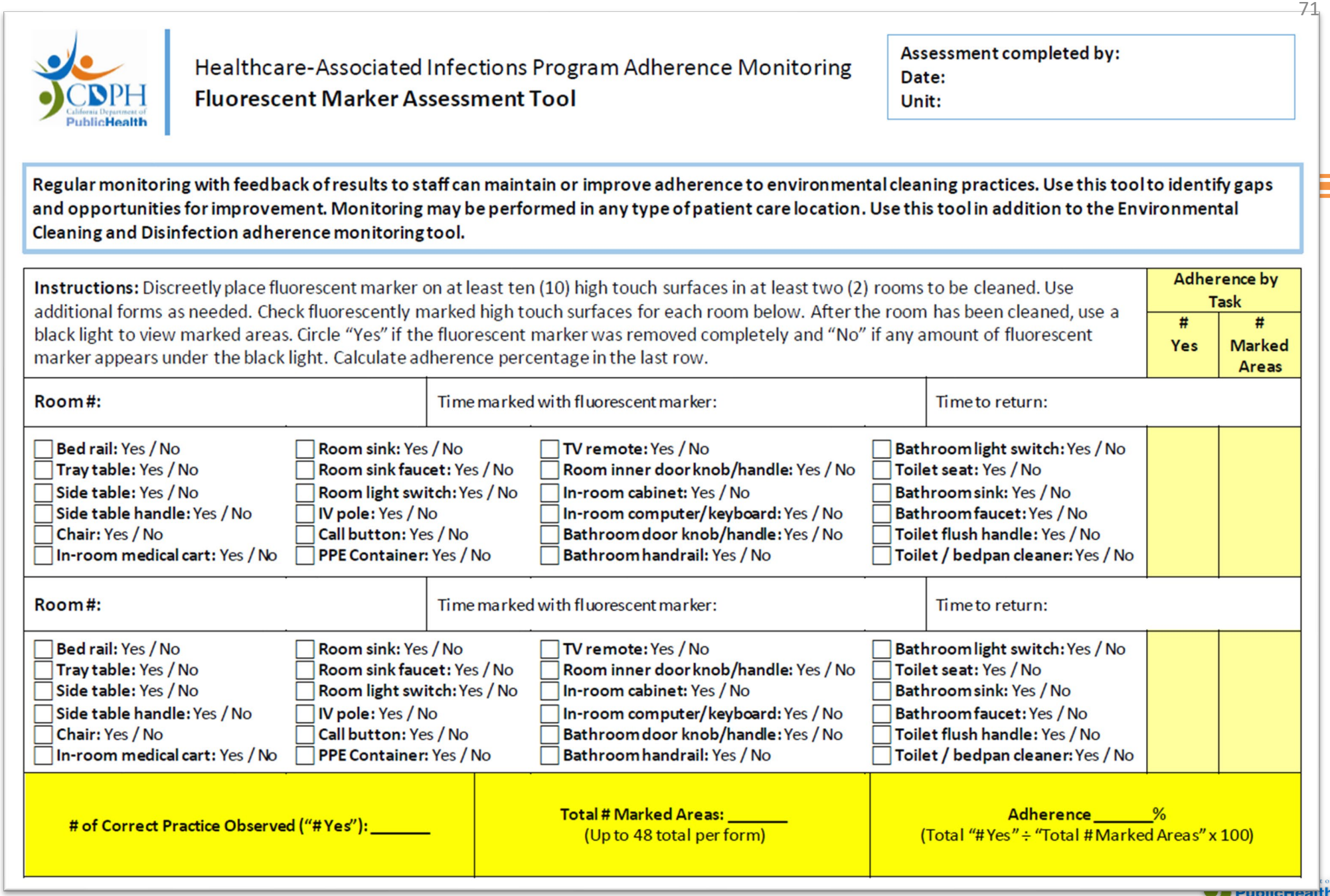
# of Correct Practice Observed ("# Yes"): _____

Total # Environmental Services Observations ("# Observed"): _____ (Up to 15 Total)

If practice could not be observed (i.e. cell is blank), do not count in total # Observed.

Adherence _____%
(Total "# Yes" ÷ Total "# Observed" x 100)

Adherence Monitoring Tool: Fluorescent Marker Assessment



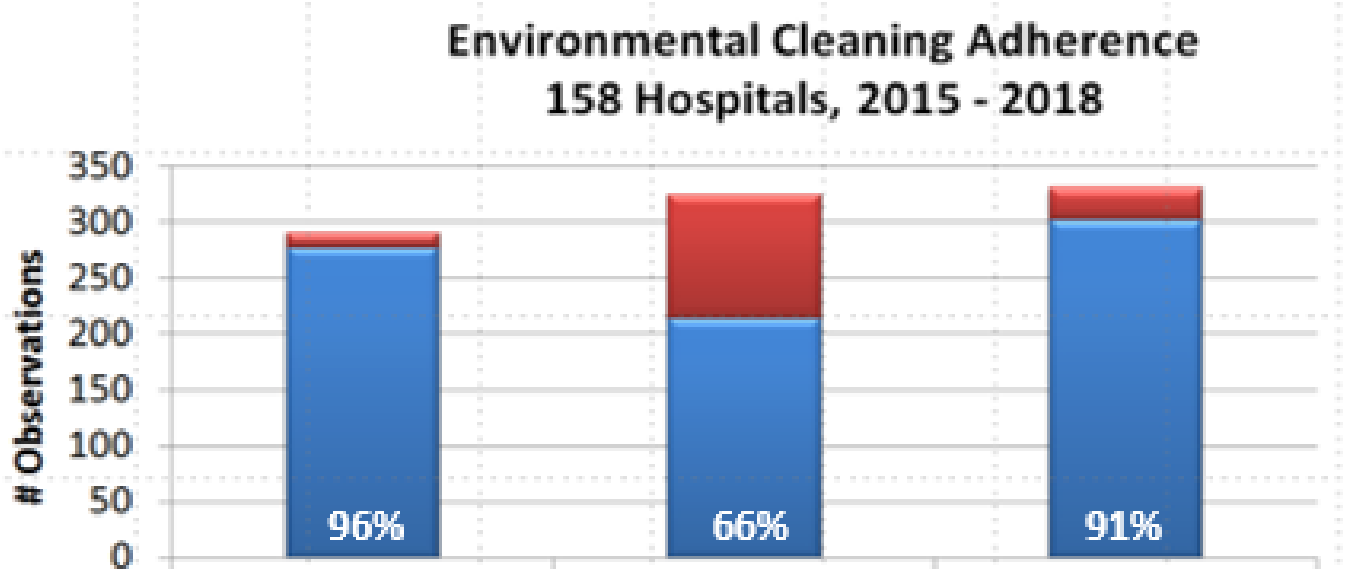
Healthcare-Associated Infections Program Adherence Monitoring
Fluorescent Marker Assessment Tool

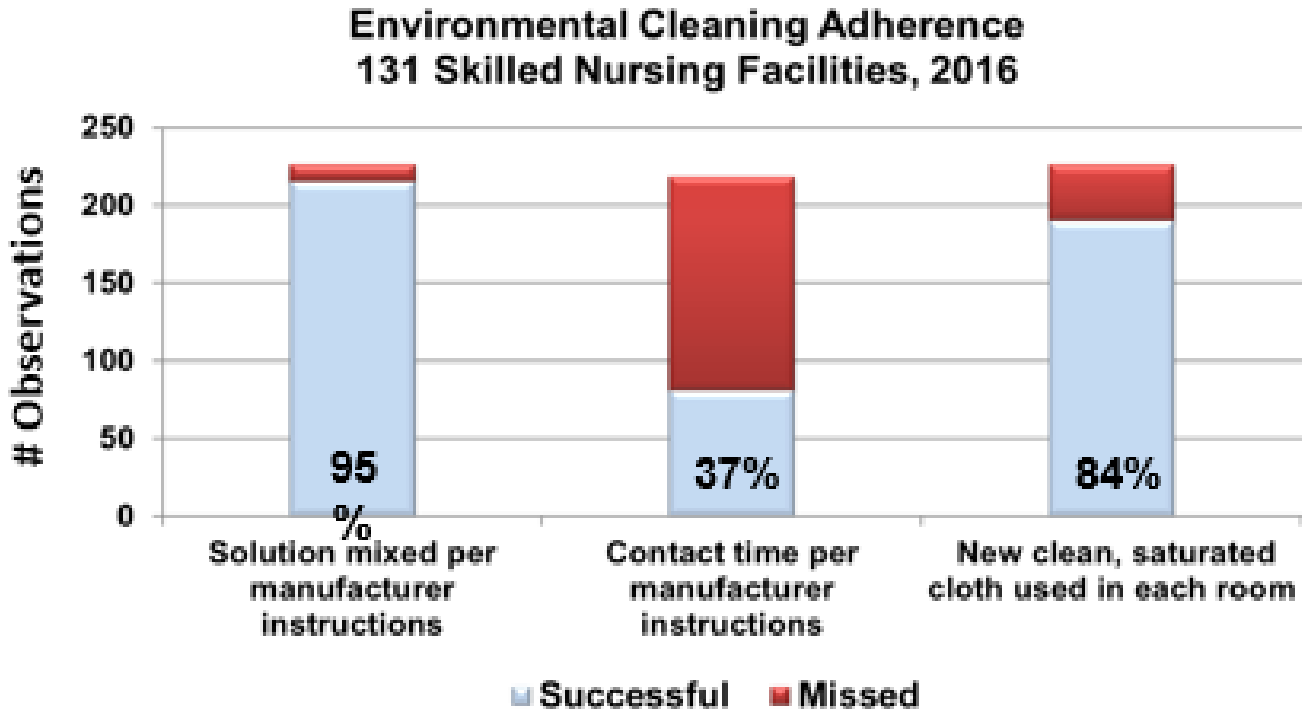
Assessment completed by:
Date:
Unit:

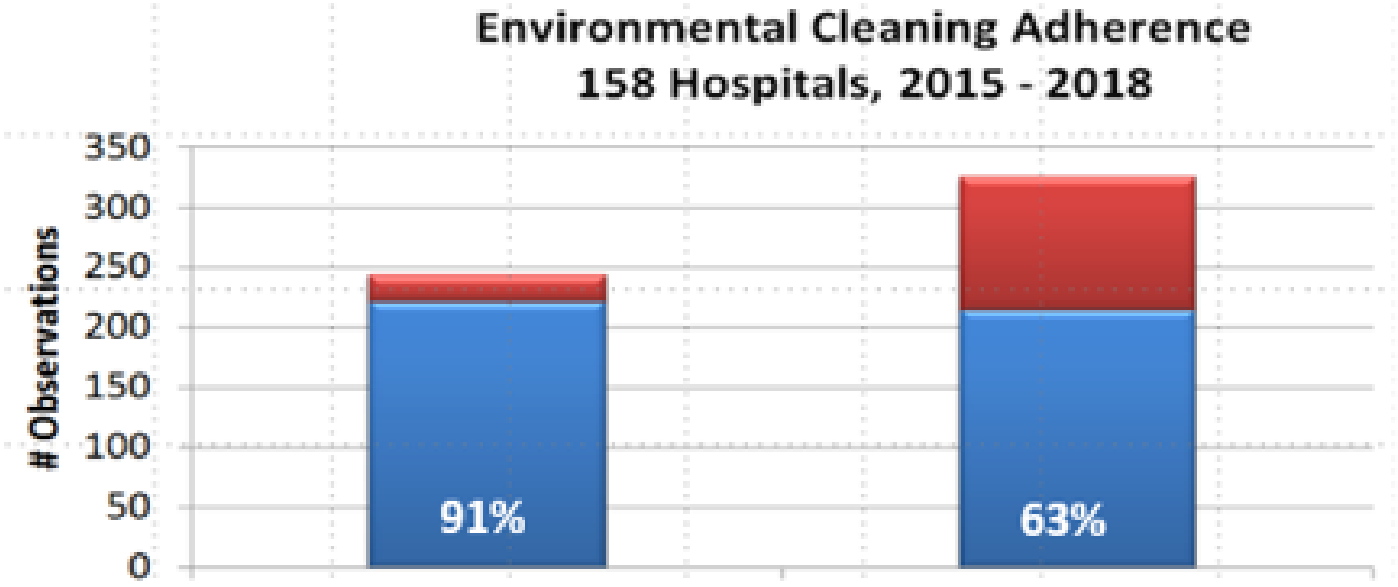
Regular monitoring with feedback of results to staff can maintain or improve adherence to environmental cleaning practices. Use this tool to identify gaps and opportunities for improvement. Monitoring may be performed in any type of patient care location. Use this tool in addition to the Environmental Cleaning and Disinfection adherence monitoring tool.

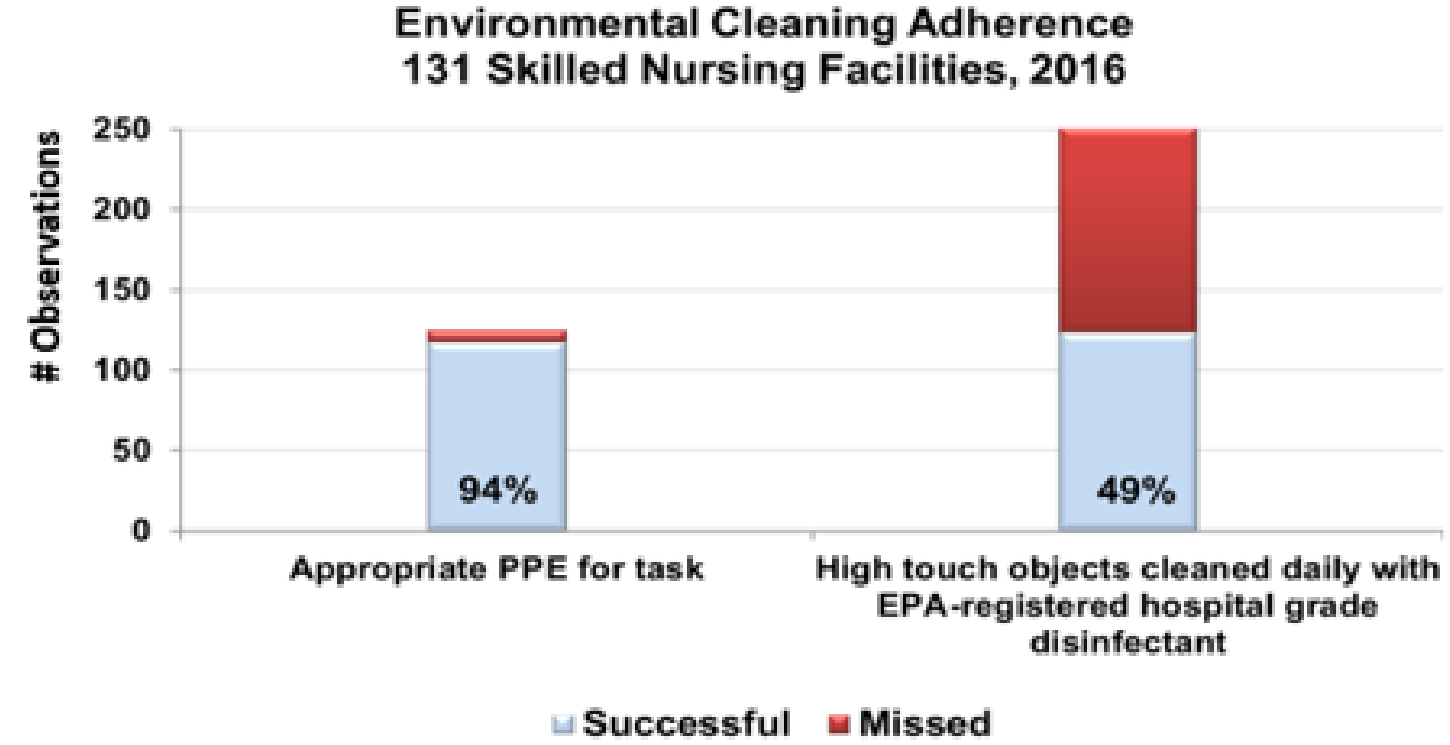
Instructions: Discreetly place fluorescent marker on at least ten (10) high touch surfaces in at least two (2) rooms to be cleaned. Use additional forms as needed. Check fluorescently marked high touch surfaces for each room below. After the room has been cleaned, use a black light to view marked areas. Circle "Yes" if the fluorescent marker was removed completely and "No" if any amount of fluorescent marker appears under the black light. Calculate adherence percentage in the last row.

				Adherence by Task	
				# Yes	# Marked Areas
Room #:	Time marked with fluorescent marker:		Time to return:		
☐ **Bed rail:** Yes / No ☐ **Tray table:** Yes / No ☐ **Side table:** Yes / No ☐ **Side table handle:** Yes / No ☐ **Chair:** Yes / No ☐ **In-room medical cart:** Yes / No	☐ **Room sink:** Yes / No ☐ **Room sink faucet:** Yes / No ☐ **Room light switch:** Yes / No ☐ **IV pole:** Yes / No ☐ **Call button:** Yes / No ☐ **PPE Container:** Yes / No	☐ **TV remote:** Yes / No ☐ **Room inner door knob/handle:** Yes / No ☐ **In-room cabinet:** Yes / No ☐ **In-room computer/keyboard:** Yes / No ☐ **Bathroom door knob/handle:** Yes / No ☐ **Bathroom handrail:** Yes / No	☐ **Bathroom light switch:** Yes / No ☐ **Toilet seat:** Yes / No ☐ **Bathroom sink:** Yes / No ☐ **Bathroom faucet:** Yes / No ☐ **Toilet flush handle:** Yes / No ☐ **Toilet / bedpan cleaner:** Yes / No		
Room #:	Time marked with fluorescent marker:		Time to return:		
☐ **Bed rail:** Yes / No ☐ **Tray table:** Yes / No ☐ **Side table:** Yes / No ☐ **Side table handle:** Yes / No ☐ **Chair:** Yes / No ☐ **In-room medical cart:** Yes / No	☐ **Room sink:** Yes / No ☐ **Room sink faucet:** Yes / No ☐ **Room light switch:** Yes / No ☐ **IV pole:** Yes / No ☐ **Call button:** Yes / No ☐ **PPE Container:** Yes / No	☐ **TV remote:** Yes / No ☐ **Room inner door knob/handle:** Yes / No ☐ **In-room cabinet:** Yes / No ☐ **In-room computer/keyboard:** Yes / No ☐ **Bathroom door knob/handle:** Yes / No ☐ **Bathroom handrail:** Yes / No	☐ **Bathroom light switch:** Yes / No ☐ **Toilet seat:** Yes / No ☐ **Bathroom sink:** Yes / No ☐ **Bathroom faucet:** Yes / No ☐ **Toilet flush handle:** Yes / No ☐ **Toilet / bedpan cleaner:** Yes / No		
# of Correct Practice Observed ("# Yes"): _____		**Total # Marked Areas:** _____ (Up to 48 total per form)		**Adherence** _____% (Total "# Yes" ÷ "Total # Marked Areas" x 100)	


Environmental Cleaning Adherence
158 Hospitals, 2015 - 2018
Observations
350
300
250
200
150
100
50
0
96%
66%
91%


Environmental Cleaning Adherence
131 Skilled Nursing Facilities, 2016
Observations
250
200
150
100
50
0
95 %
37%
84%
Solution mixed per manufacturer instructions
Contact time per manufacturer instructions
New clean, saturated cloth used in each room
Successful
Missed


Environmental Cleaning Adherence
158 Hospitals, 2015 - 2018
Observations
350
300
250
200
150
100
50
0
91%
63%


Environmental Cleaning Adherence
131 Skilled Nursing Facilities, 2016
Observations
250
200
150
100
50
0
94%
49%
Appropriate PPE for task
High touch objects cleaned daily with EPA-registered hospital grade disinfectant
Successful
Missed

Adherence Monitoring Tool: Environmental Cleaning and Disinfection Responsibility Assessment

Healthcare-Associated Infections Program

Environmental Cleaning and Disinfection – Responsibility Assessment

Everyone is responsible for the cleanliness of the care environment. It is recommended to keep an updated checklist of *who cleans what* in your policy. The following items may be used to develop a checklist for assigning cleaning responsibilities among staff. This tool may also be used as an assessment or teaching tool to identify gaps and opportunities for improvement.

Instructions: Ask at least four (4) staff with different titles to list who cleans each item. Compare responses to your facility's policy. Look for areas where it is unclear who cleans certain items or if there is a mismatch among respondents. Use the results from this exercise to remind and reeducate staff on the importance of environmental cleaning. Example respondents include: infection preventionists, EVS managers, nurses, respiratory therapists, EVS workers.

Who is responsible for cleaning:	Respondent #1 Title:	Respondent #2 Title:	Respondent #3 Title:	Respondent #4 Title:
ABHR dispenser				
Bathroom				
Bedrail				
Blood pressure machine				
Call button				
Charting area				
Floor				
Floor, with large spill				
Glucometer				
In-room computer/keyboard				
IV pole				
IV pump				
Light switch				
Medication cart				
Oxygen tank				
Patient linen				
PPE container				
Privacy curtains				
Reusable thermometer				
Room/toilet sink				
Side table				
TV remote				
Ventilator				
Ventilator alarm in hallway				

HEALTHCARE-ASSOCIATED INFECTIONS (HAI) PROGRAM

Environmental Cleaning

Welcome to the California Department of Public Health (CDPH) Healthcare-Associated Infections (HAI) Program environmental cleaning in healthcare facilities web page. The purpose of this page is to answer questions and provide information on maintaining a clean and sanitary environment in healthcare facilities for patients, visitors and staff. Reducing bioburden in the environment decreases potential for transmission of harmful organisms. Information is presented as frequently asked questions (FAQ) with references and links to additional information. The initial content on this page will emphasize the importance of environmental cleaning for stopping the spread of *C. difficile* diarrheal infections (CDI).

Additional content will be added in the coming months. For questions, suggestions, or more information, please email HAIProgram@cdph.ca.gov.

Role of Environmental Surfaces in Disease Transmission

Effective Cleaning Strategies

CDPH HAI Program's Environmental Cleaning webpage
(www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/EnvironmentalCleaning.aspx)

California Department of PublicHealth

C. auris Cleaning and Management Training Video

GNYHA *C. Auris* Cleaning and Management

(vimeo.com/350168460)

Summary

- A properly cleaned care environment is essential to prevent MDRO transmission and infections
- Follow a standard process that ensures consistency and prevents cross-contamination
- Clean/disinfect high-touch surfaces at least daily
- Follow manufacturers' instructions on the label including wet contact time for proper use of disinfectant
- All staff members have roles in ensuring a clean patient care environment

Resources

- Environmental Protection Agency Guide to Registered Disinfectants **(Pesticide Registration)** (www.epa.gov/pesticide-registration/selected-epa-registered-disinfectants)
- CDC Guideline for Disinfection and Sterilization in Health Care Facilities (PDF) **(Disinfectants Cleaning, Sterilization)** (www.cdc.gov/infectioncontrol/pdf/guidelines/disinfection-guidelines.pdf)
- CDC Guidelines for Environmental Infection Control in Healthcare Facilities (PDF) **Water, Air, Medical Waste, Pet Therapy, Construction)** (www.cdc.gov/infectioncontrol/pdf/guidelines/environmental-guidelines.pdf)
- CDC Tool kit: Developing a Water Management Program to Reduce Legionella Growth and Spread in Buildings (PDF) (www.cdc.gov/legionella/downloads/toolkit.pdf)
- California Medical Waste Management Act (PDF) (cchealth.org/eh/solid-waste/pdf/medical_waste_management_act.pdf)

Next Steps

- ❑ Fill out the **course evaluation**
- ❑ Ensure **leadership approvals** to participate (send in your Commitment Form)
- ❑ Schedule your **onsite baseline assessment** (Goal: complete by May 31, 2022)
- ❑ **Form a team** and identify key staff (vSNF Champions!)
- ❑ **Join us for our next workshop on May 11**: Infection Prevention Fundamentals Part 2, Introduction to MDRO
- ❑ Access resources on **vSNF Workgroup Webpage** (www.cdph.ca.gov/hai/vsnf)

Questions?

Contact Erin Garcia at Erin.Garcia@cdph.ca.gov