

**Infection Prevention and Control
Skills Station Series**

Use of Simulation to Promote Cleaning and Disinfection of Reusable Medical Equipment

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The contents of this packet include fundamental core infection prevention and control concepts. Simulation scenarios outlined in this packet were developed by the Kentucky Infection Prevention Training Center (KyIP) using fundamental core infection prevention and control concepts in collaboration with the Center of Diseases and Control's (CDC's) Project Firstline training initiative.

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INTRODUCTION TO PROJECT FIRSTLINE

About Project Firstline

Project Firstline is a national collaborative led by the U.S. Centers for Disease Control and Prevention (CDC) to provide infection control training and education to frontline healthcare workers and public health personnel. The Kentucky Infection Prevention Training Center is proud to partner with the Kentucky Department of Public Health and Project Firstline. Funding for the Kentucky Infection Prevention Training Center (KyIP) is provided through the Centers for Disease Control and Prevention (CDC) Epidemiology and Laboratory Capacity (ELC) Enhancing Detection grant supplement award to the Kentucky Department for Public Health (KDPH). CDC is an agency within the Department of Health and Human Services (HHS). The contents of this simulation skill packets do not necessarily represent the policies of CDC or HHS and should not be considered an endorsement by the Federal Government.

Project Firstline provides innovative and accessible infection control education for all frontline healthcare workers – so they can protect their patients, their coworkers and themselves from infectious disease threats in health care. As a collaborative, Project Firstline brings together more than 75 healthcare, academic, and public health partners to reach a wide range of healthcare audiences and settings across the country. Project Firstline offers educational resources in a variety of formats to meet the diverse learning needs and preferences of the healthcare workforce. Resources are designed using adult learning principles, educational best practices, CDC recommendations, and the science that informs them.

Learn more about Project Firstline: <https://youtu.be/PUjZlVlw-I>

The Concept of Infection Control

The goal of everything we do in infection control, for any disease, is to keep people from getting sick. The goal of Project Firstline is to make sure you have the infection control knowledge that you need and deserve to keep yourself, your patients, your colleagues, and your family safe.

Link to: What is the goal of infection control?

<https://www.cdc.gov/infectioncontrol/projectfirstline/videos/Ep1-Goal-LowRes-New.mp4>

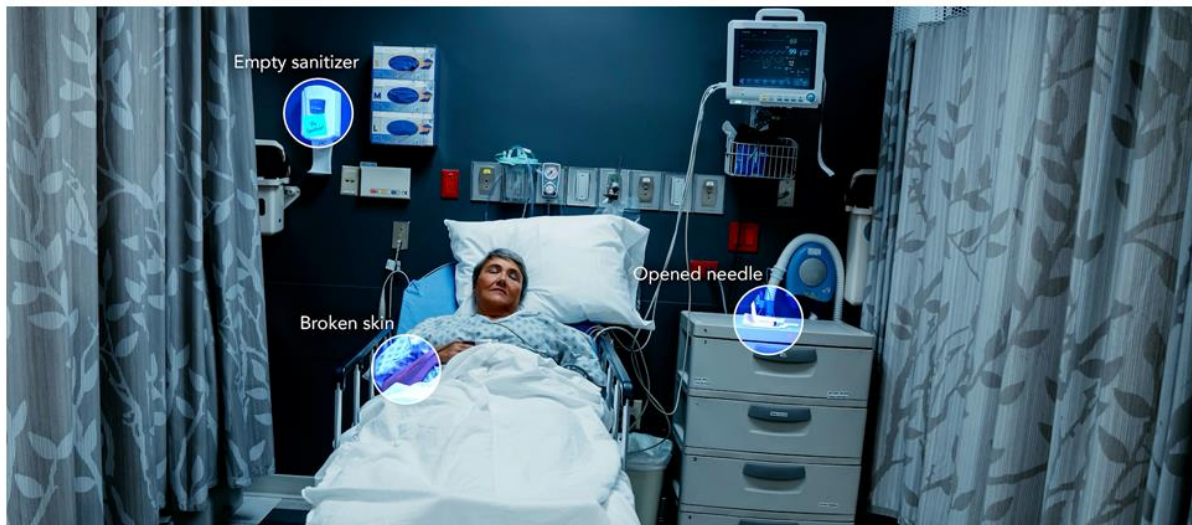
Risk Recognition

Risk recognition is seeing the potential for a problem to happen. You see risk every day at home and at work, and you take steps to minimize it. You can help control infections in healthcare by learning to recognize the risks for germs to spread and cause infection, and not letting it happen. Healthcare is a unique setting – we consider germs differently in healthcare than we do in other places, like at home or in the community. The work that we do in healthcare presents many opportunities for germs to spread. Everyone, no matter your training or role, can recognize an infection risk and take action to keep germs from spreading.

No two days are the same in health care but caring for and protecting patients is always the top priority. This includes protecting patients from getting infections while they are receiving care. With a foundational knowledge about germ spread and the “why” behind infection control, you can recognize infection risks and make the right decisions to prevent people from getting sick, regardless of what the day brings.

Recognize Infection Risks in Health Care

[Español \(Spanish\)](#) | [Print](#)



Source: [Recognize Infection Control Risks in Health Care](#) | [Project Firstline](#) | [CDC](#)

Explore Project First line’s educational content and resources to learn more about **where germs live in healthcare settings** and how to **recognize the risk** for them to spread – which is the first step in understanding when to take action to protect your patients and yourself from infections.



Link to risk recognition in healthcare:

<https://www.cdc.gov/infectioncontrol/projectfirstline/videos/RecognizeRisks-LowRes.mp4>

As you're going about your workday, there are certain things that you are likely already doing to reduce the risk of spreading germs, like cleaning your hands between tasks or cleaning and disinfecting shared medical devices. *Standard Precautions* are the things you're doing, every day, for every patient, to keep germs from spreading. Because risks will always exist in healthcare settings, we follow these Standard Precautions to protect patients and ourselves — regardless of whether you know a patient has a specific infection — because often you don't know.

Recognizing infection risks goes beyond Standard Precautions. Because no two days in health care are ever the same, there will be moments when healthcare workers might need to apply infection control recommendations to situations that aren't usually described in guidelines. That's why understanding how germs spread and make people sick is so helpful — **it allows you to recognize infection risks throughout your workday, no matter the moment.**

What are Reservoirs?

"Reservoirs" are the places on and in our bodies and in the environment where germs live. Germs frequently spread between and among these reservoirs.

Four reservoirs in the human body that are important for infection control are

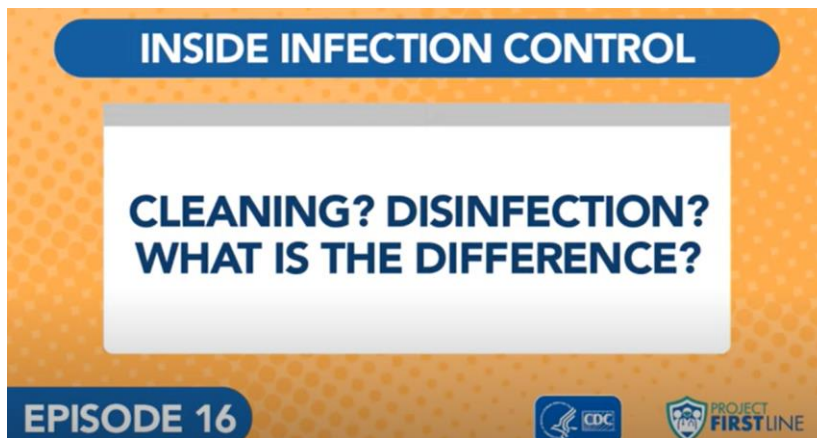
1. The skin;
2. The gastrointestinal (GI) system or "gut";
3. The respiratory system; and blood.

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Understanding where germs live helps us recognize where there is risk for them to be spread, and helps us understand why infection control actions work to stop them from spreading and making people sick.

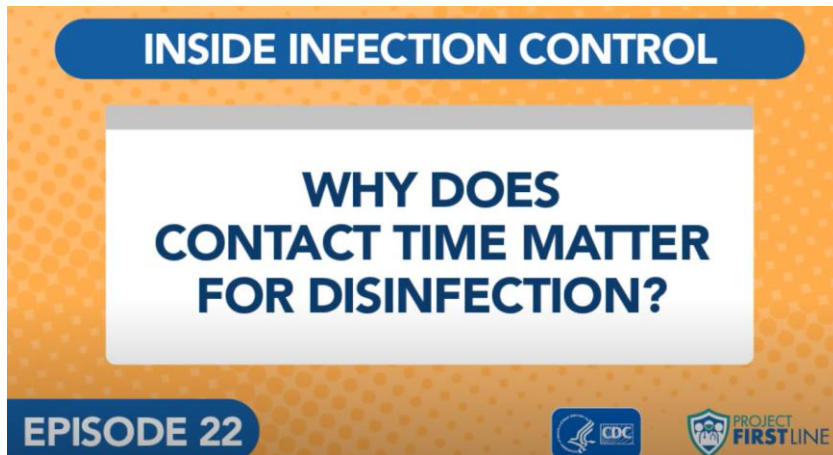
Project Firstline Vlogs: Cleaning and Disinfection

This short (4:23 minute) vlog provides information presented by Dr. Abby Carlson regarding the differences between cleaning and disinfection and the importance of both when addressing risk and safety in the healthcare environment.



[Episode 16: Cleaning? Disinfection? What is the Difference? - YouTube](#)

Cleaning and disinfection are both important ways to keep infections from spreading in healthcare, but they are not the same. In this episode of Inside Infection Control, Dr. Abby describes the differences and how appropriate cleaning and disinfection in healthcare settings protects patients and staff.



[Episode 22: Why Does Contact Time Matter for Disinfection? - YouTube](#)

In this episode of Inside Infection Control, Dr. Abby describes why disinfectant contact time can make a big difference in stopping the spread of germs. Check it out so that you can feel confident knowing you're taking the correct steps to slow or stop the spread of infectious diseases like COVID-19.

Health Equity Guiding Principles for Inclusive Communication

The contents of this packet incorporates the CDC's Health Equity for Inclusive Communication. These principles are intended to help health communicators ensure that their communication products and strategies adapt to the specific cultural, linguistic, environmental, and historical situation of each population or audience of focus.¹



Link to Spanish resources: <https://www.cdc.gov/infectioncontrol/projectfirstline/es/index.html>

INTRODUCING SIMULATION AS A TOOL IN INFECTION PREVENTION EDUCATION AND TRAINING

Every day one out of every 31 hospitalized patients end up with a healthcare-associated infection (HAI).² This leads to an increased number of days hospitalized, a higher risk of mortality, and increased cost to the healthcare system. Unfortunately, HAIs have occurred in virtually all healthcare settings and have affected patients, residents, and healthcare workers. The ongoing rates of HAIs coupled with the challenges posed by the SARS-CoV-2 pandemic have underscored gaps in infection prevention practice and the need to refocus on basic principles of infection prevention.

The goal of the Infection Prevention Skills Stations Series is to provide opportunities for healthcare personnel to review basic infection prevention core practices and apply them through a variety of simulated learning experiences. Simulation is a process where situations encountered during healthcare can be represented, demonstrated, or performed using a variety of educational techniques. This approach serves as a connection between traditional classroom learning with real-world clinical experiences. The benefits of simulation learning include a range of learning opportunities, the ability to make mistakes without harm; the chance for evaluation and feedback, and the opportunity to practice a skill hands-on until proficient, and that is important for all healthcare workers.³ Participants in simulation can apply knowledge and critical thinking in situations that occur in all settings where healthcare is delivered including acute, long term, and ambulatory care and can be used with novice and experienced learners.^{4,5} The key is to make simulations relevant to the individual.

This Skills Station will introduce you to the concept of simulation in healthcare, specifically in the areas of infection prevention (IP) and focused on Personal Protective Equipment. This simulation is designed to reach new and experienced learners in healthcare and seeks to create a fundamental understanding of infection prevention practices using scenarios that will show how various healthcare interactions, even those seemingly small, can lead to devastating complications and negative outcomes. Our hope is that this simulation can be used routinely as part of healthcare education and training, and ultimately decrease infection associated with patient care.

This Skills Station is organized into the following six sections:

1. The name or topic of the simulation is aligned with areas of practice or outcomes included in the Centers for Disease Control and Prevention (CDC) Core Infection Prevention and Control Practices for Safe Healthcare Delivery in all Settings—Recommendations of the HICPAC.⁶

2. Learning objectives are outlined at the beginning of each Skills Station to define the problem and outline intended outcomes for the learner.
3. Each station will be structured into Pre-brief, Simulation, and Debrief segments and designed to take approximately one hour. Now, remember your audience. For novice and beginner learners, education or pre-briefing may be better assigned prior to coming into the simulation and having a quick recap to Pre-brief before the simulation session. For more proficient or expert learners, the Pre-brief may only need to occur right before the simulation begins. Debriefing is the most critical part of the process and should be the segment where sufficient time is devoted for engagement, interaction, and reflection. The Skills Stations have been structured with information for each section to standardize and streamline the process. A variety of simulation approaches have been incorporated across the Series and include video demonstrations, role playing scripts, games, group interactions, and instructions for return demonstrations.
4. A list of supplies needed for the individual Skills Station is provided. If expired supplies are used, it is vital that those supplies remain separated from supplies that will be used in actual patient care situations.
5. The workflow process for each Skills Station is included to help organize the learning session. A suggested time flow for the simulation, and specifics regarding each of the segments, is included in the section below.
6. Evaluation of performance of the learners as well as their perceptions of the experience are important to capture. This information may assist with additions or improvement to the process and serve to demonstrate value to the use of simulation for infection prevention practice for front-line healthcare workers.

TITLE: USE OF SIMULATION TO PROMOTE APPROPRIATE CLEANING AND DISINFECTION OF REUSABLE MEDICAL EQUIPMENT

LEARNING OBJECTIVES:

At the end of this Skill Station, participants will be able to:

1. Define the role of reusable medical equipment in pathogen transmission
2. Review types of low- and intermediate-level disinfectants used in healthcare settings
3. Introduce the Spaulding Classification as a guide for use of disinfection approaches relevant to reusable medical equipment
4. Apply knowledge in practice to minimize risk associated with pathogen transmission and reusable medical equipment

PRE-BRIEF (BACKGROUND)

As we move through these objectives, the information is structured into three sections. The Pre-Brief section provides basic information that establishes background concepts important when outlining the 'why' behind the content. The content is divided into small bite-sized learning

opportunities provided in a question and answer format. The second section will contain simulation examples. These examples seek to demonstrate application of the content and visually demonstrate the reason it is important for healthcare workers to understand the rationale, or the 'why', behind infection prevention measures. The last section is the De-Brief. During this last section, participants are guided through discussions that dive deeper into the knowledge application challenges and barriers and help participants take steps enabling them to put knowledge into action that is scalable and transferrable to various situations and care settings.

What is reusable medical equipment?

Patient care in almost every setting involves the use of equipment that is not disposable or single use. Examples include blood pressure machines, glucose meters, thermometers, infusion pumps, and patient furniture. Some reusable medical equipment is used for more specialized purposes including laryngoscope blades, ultrasound probes, and surgical instruments. This shows that not all pieces of medical equipment are used for the same purpose and not all are cleaned and disinfected in the same way. The important points to know include: a) the intended use of the equipment, b) whether or not it comes into contact with healthy intact or non-intact skin, and 3) whether or not it will be used for different patients, for example, moved from patient to patient. Using equipment that has been properly cleaned and disinfected is both a patient safety and a healthcare worker safety activity.^{7,8}

What is cleaning and why is it important?

Cleaning is removal of visible soil (e.g., organic and inorganic material) from objects and surfaces and normally is accomplished manually or mechanically using water with detergents or enzymatic products. Thorough cleaning is essential before disinfection because inorganic and organic materials (e.g., blood or other body fluid) that remain on the surfaces of instruments interfere with the effectiveness of these processes. Removal of visible soil should be done prior to disinfection. Removal may be accomplished through manual practices such as the use of cleaning cloths and friction, or it may be accomplished through mechanical means such as cleaning done using a floor scrubber or automatic instrument cleaners. Cleaning products have agents that help suspend the organic and inorganic material so those materials can be more easily removed. Detergents help suspend the soil so it can be wiped away. Some products use enzymatic agents that help breakdown the soil so it can be more easily removed. Some germicide products combine a detergent with the chemical disinfectant so one product can be used to both clean and disinfection. It is important to recognize that not all germicides enable this one-step cleaning and disinfection process, so labels should be carefully read prior to use.⁹

What is disinfection and why is it important?

Disinfection is a process that eliminates many pathogenic microorganisms, but not all bacterial spores, on inanimate objects. In health-care settings, objects are commonly disinfected through the use of liquid chemicals commonly called germicides. Germicides, also called disinfectants, are regulated by the Environmental Protection Agency (EPA). There are different types of disinfectants, but those used within healthcare are known as ‘Hospital-grade’ disinfectants. Their use is not restricted to only hospitals. Instead, this designation indicates that the pathogens impacted by the disinfectant are those pathogens more commonly seen in healthcare compared to pathogens seen in the home or public spaces. Therefore, disinfectants used in all healthcare settings should be recognized as a hospital grade disinfectant. Further, disinfectants should be able to address emerging pathogens. The EPA maintains a list of disinfectants suitable for use when disinfecting items used in facilities needing this broad coverage. This list of disinfectants is included in the EPA List N and can be found on the EPA website.¹⁰

What are the basic activities that must be included in a safe and effective approach for cleaning and disinfection of reusable medical equipment?

Cleaning, disinfection, and sterilization are essential for ensuring that medical and surgical instruments do not transmit infectious pathogens to patients. Procedures involving sterilization of reusable medical equipment will be addressed in other skills stations. This skills station will focus on items that are routinely used during patient care outside procedural and operative settings.

Activities that are part of a safe and effective approach for cleaning and disinfection of reusable medical equipment include:

- Proper cleaning and disinfection procedures that are written and used for personnel training,
- Training processes that ensure familiarity with established infection control practices by personnel,
- Use of equipment manufacturers’ protocols for cleaning and disinfecting reusable equipment to inform written policies and procedures,
- Practice that ensures cleaning and disinfection of all environmental surfaces in a patient care area, including reusable medical equipment,
- Personnel are familiar with the equipment being cleaned and disinfected
- Use of friction to clean and disinfect equipment,
- Use of appropriate disinfectant solution, including assurance that concentrated germicides are properly and safely diluted,
- Before disinfection, the equipment is inspected for visible soil. If present, soil is removed prior to disinfection,

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- Use of disinfection practices that ensure the disinfectant comes into contact with all surfaces of the medical equipment being cleaned and disinfected,
- If disinfectant is applied via spray, the germicide is applied to all surfaces. If a pop-up wipe is used, the wipe is damp enough so the surface(s) being disinfected can come into contact with sufficient amount of the disinfectant. Items are allowed to dry after disinfection before another use.

How do we know what items need to be disinfected in the healthcare environment?

The framework used to guide how reusable medical equipment is cleaned, disinfected, and sterilized (if appropriate), is the Spaulding classification. This classification categorizes the processing of instruments and equipment for patient care as non-critical, semi-critical, or critical according to the degree of risk for infection involved in use of the items. **Figure 1** shows the Spaulding Classification and some examples in each of those three categories [non-critical, semi-critical, and critical].¹¹

FIGURE 1. SPAULDING CLASSIFICATION

Level of Risk to Patient	Definition	Descriptive Application	Examples	Disinfection Method
Non-Critical	Device only contacts intact, healthy skin	Items that do not make contact with the patient or, if they do, only with intact skin.	· Stethoscope · Scanning thermometer · Scanning ultrasound probe · Glucose meter (not the lancing device that pierces the skin and is disposable) · Blood pressure cuff · Patient furniture	Low Level Disinfection (LLD) using an intermediate level disinfectant (ILD) products
Semi-Critical	Device contacts mucous membranes or non-intact skin	Items making direct contact with mucous membranes, but the tissues are intact and therefore constitute barriers to infection.	· Laryngoscope blade · Flexible endoscope · Endovaginal ultrasound probe	High Level Disinfection (HLD)
Critical	Device contacts sterile tissue or enters the bloodstream. Also includes devices that may come in contact with a device that contacts sterile tissue or enters the bloodstream	Items are either introduced beneath the surface of the body or attached to another object that is.	· Surgical instruments · Biopsy needles with or without a transfer device · Needles or catheters inserted into the bloodstream · Ultrasound probe used for real time vascular access guidance	Sterilization

In general patient care areas including acute care, long term care, clinics, and behavioral health settings, a majority of reusable medical equipment falls into the **non-critical** category and disinfection is done using an EPA-registered healthcare grade disinfectant. Non-critical items are those that come in contact with intact skin but not mucous membranes. Therefore, there is no critical need for the items to be sterile or undergo a higher level of disinfection. **Low** or **Intermediate-level disinfectants** may be used for non-critical items such as wiping of blood glucose monitors, blood pressure cuffs, patient furniture, IV poles or surfaces with no visible blood in between patients. These are EPA- registered hospital disinfectants, most with a tuberculocidal claim (chlorine- based products, phenolics, quaternary ammonium compounds) and destroy vegetative bacteria, fungi and viruses, and mycobacteria. Some may also kill spores (sporicidal). It is important to know that having a tuberculocidal claim does not mean the disinfectant is used to prevent tuberculosis. Instead, this means that the germicide is effective against a broader group of common healthcare pathogens compared to a low-level disinfectant. Intermediate-level disinfectants are the primary germicides used for general disinfection in healthcare settings.

Equipment used in surgical settings, procedure areas, and emergency and urgent care areas may involve invasive procedures necessitating a higher level of disinfection. These items may be classified as semi-critical or critical and need high level disinfection or sterilization. Semi-critical items which touched mucous membranes or non-intact skin require a disinfection process (**high-level disinfection [HLD]**) that kills all organisms with the exception of high numbers of bacterial spores. This type of disinfection is appropriate for equipment such as respiratory therapy and anesthesia equipment, endoscopes, and endocavitary probes. High-level disinfecting solutions are not used for routine environmental cleaning and disinfection. Likewise, chemical sterilants are not used for routine environmental cleaning and disinfection.⁷

Figure 2 shows some commonly used Low and Intermediate-level disinfectants with some of their advantages and disadvantages.^{7,9}

FIGURE 2. EXAMPLES OF SOME COMMONLY USE LOW AND INTERMEDIATE-LEVEL DISINFECTANTS

Disinfectant	Advantages and Disadvantages
Quaternary ammonium compound (Low)	Used broadly in healthcare for routine cleaning and disinfection. Classified as a low-level disinfectant, but may contain a tuberculocidal claim. Broadly compatible with hard surfaces. Concerns regarding their binding with, or being absorbed by, materials and fibers including cotton. Cotton products may include cleaning cloths and mops. Quats usually have a 3-10 minute contact time.
Quaternary ammonium with alcohol (Intermediate)	With the addition of alcohol (usually isopropyl alcohol), these disinfectants are able to effectively kill a broader group of pathogens including Hepatitis and HIV [bloodborne pathogens]. This broader ability enables these disinfectants to also kill Mycobacterium tuberculosis (MTB). This does not mean that patients with tuberculosis need this particular germicide to be used in their rooms. Instead MTB is used as a surrogate demonstrating an ability to kill other organisms, specifically bloodborne pathogens. With this ability, these germicides gain what is known as a “TB kill claim”. QUATS with alcohol do not contain a detergent so pre-cleaning must be done to remove any organic matter, such as blood or other body fluids, to enable the germicide to effectively work. These disinfectants are intermediate-level disinfectants but are not sporicidal. Many of these products are also available in pop-up wipes and additional of alcohol enables a shorter contact time, generally 2-5 minutes.
Sodium hypochlorite (Intermediate)	Most commonly used chlorine disinfectant. Commercially available as household bleach. This chemical is stable and fast acting. Although considered safe, bleach can cause skin and eye irritation, so eye protection is recommended during use. It is corrosive to metal and may discolor fabrics. Hypochlorites effectively kill bacteria, fungi and viruses and are also considered to be sporicidal when appropriately diluted. Organic matter must be cleaned before this agent is used for disinfection to prevent inactivation. Inhalation of chlorine vapors can cause or worsen asthma and other respiratory conditions, so care must be taken to avoid situations where chlorine vapor can accumulate.
Phenolic (Intermediate)	Best used as a disinfectant for non-porous surfaces. If used improperly, can be dangerous to newborns. Policies in maternal-child areas often include a rinse step after use. Product residue can irritate the skin and may be harsh on prepared surfaces such as waxed floors.
Accelerated hydrogen peroxide (Intermediate)	These products are safe for the cleaning staff and the environment with the lowest EPA toxicity category. They are one-step cleaners and disinfectants and are effective in the presence of organic matter and blood. They are efficient with short dwell times and are effective against bacteria, viruses, mycobacteria, and pathogenic fungi. Not sporicidal.
Peracetic acid (Intermediate)	These disinfectants are rapid-acting and are bactericidal, fungicidal, virucidal, mycobactericidal, and sporicidal. They can become unstable when diluted. They can corrode some metals such as copper and brass. Strong odor.

What is meant by Contact Time?

Also known as 'dwell time' or 'wet time', this is the amount of time needed to complete disinfection after the disinfectant has come into contact with the surface. For disinfection to occur, the surface must be wet long enough to maintain the stated time on the product label. Most often, the required contact time is 1-3 minutes, but some products require a 10 minute contact time. As typical room environments with controlled ambient temperatures and airflow, surfaces dry quickly so a long contact time may interfere with the disinfection process.⁷

As healthcare personnel become increasingly involved in surface disinfectant and organizations make pop-up wipes increasingly available, users need to remember that the wipes must be wet when used and the area of use must be small enough so the surface can come in contact with enough of the solution that it can remain wet for the required contact time. Personnel should use an appropriate number of wipes for the equipment and the wipes should be pulled from containers that have been closed so drying of the cloths has been avoided. Once surfaces are wiped, they should be allowed to air dry and not wiped thereby removing the germicide before contact time has been achieved.

Where disinfection should be performed?

Most non-critical items may be cleaned and disinfected where they are used. Some items, including infusion pumps, may be transported to a central location for cleaning and disinfection so a preventive maintenance and inspection process can occur.

SIMULATIONS

Workflow for Simulations

- Test all virtual connections including those with learners as well as video access
- Have all videos open and available for rapid and sequential access to minimize down time during the simulation
- Have resources available in PowerPoint format with ability to share screen with virtual learners, or have paper copies if needed for in-person learners. You want all learners to indicate their responses for the scenario questions during Simulations 1 and 3 so determine how to best capture this information. Polling questions, self-reported scores in Zoom chat, verbal responses, or written submissions are examples of methods that can be used.
- Go through each simulation and perform Debrief following all videos, discussions, and scenario responses
- Use the PEARLS Debriefing Tool to help guide the discussion. The goals with the debriefing include:
 - Learner reactions to the simulations
 - Clarifications, if needed

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- How the simulations impact current practices, or not
- Challenges to performance
- Additional comments from learners
- Takeaway points
- Key learning points (review the objectives)

Simulation #1: Role of the environment in pathogen transmission

Description: This video demonstrates interaction between a healthcare worker, the environment, and reusable medical equipment. During the first part of the video, you can see those interactions that may represent typical care when a healthcare worker is engaged in patient care. The second part of the video uses fluorescent powder to demonstrate all of the items that have been touched and opportunities for contamination and pathogen transfer. When patients and healthcare personnel interact with the environment, surfaces become opportunities for contamination. Contaminated surfaces that are touched by the hands of healthcare personnel and patients allow opportunities for movement of organisms from surfaces to hands, and from hands to surfaces. Reusable medical equipment can serve as a reservoir for pathogens and must be part of a consistent and reliable environmental disinfection process. Equipment that may be used as part of care with one patient, must be cleaned and disinfected before moving to another patient. If not properly cleaned and disinfected, the reusable medical equipment may serve as a vehicle for pathogen transmission. Pathogens cannot be seen, so standard practices must be part of a patient safety approach. Use of visual elements during this simulation help develop the mental model for contamination and patient risk.

Audience: In-person or virtual learners.

Supply List: Simulation #1

- Video- Healthcare worker and environmental contamination
- Equipment to show video in-person or virtually
- Live or virtual connection with learners
- Mechanism for learners to take notes
- PEARLS Healthcare Debriefing Tool for Simulation leader

Additional supplies for in- person simulation set up: (if applicable)

Suggested time flow for the simulation: The video has no sound, so the facilitator can stop and start the 3 minute video as needed.

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Link to video: https://www.dropbox.com/s/dikymqwgdgafnra/improper_hand-hygiene_08052022b_lg.mp4?dl=0

The key takeaway messages from this first simulation experience helps address the question as to why environmental contamination is an infection risk. As we provide care, think about what opportunities for pathogen transmission were evident in the video. As learners if they see similar opportunities during your care activities. What were the most striking learning points recognized by learners applicable to their care and job responsibilities? Think about how learners may take this information and make changes in their own practice. Also, consider how to use this as we work as a team and together identify transmission opportunities so they can be corrected.

As facilitators use this video, stop and point out visual evidence of contamination. Ask for responses to the video. Use this opportunity to make it applicable to the learners' setting. For example, learners may work in long term care facilities so make the setting relevant to their work. You may also use this during educational opportunities for support personnel such as environmental services or other healthcare workers such as respiratory therapists. Make sure to include information specific to those learners to they can better understand and apply the important teaching points.

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Simulation #2- review of PFL infographic on how to read a disinfectant label

Description: This simulation helps to demonstrate information contained on a germicide product label. During this exercise, learners are asked about important germicide attributes such as ingredients, safety, and contact time. They will be asked to list some of those attributes that were provided during the learning session. A resource with the ability for the learner to list five attributes is provided in the Appendices. An answer key with a list of attributes is also provided. The infographic shown on the slides shows how to read a label and how to identify those attributes.

Audience: In-person or virtual learners

Supply List: Simulation #2

Infographic- How to Read a Disinfectant Label

Equipment to show graphic in-person or virtually

Worksheet to list attributes

Live or virtual connection with learners

Mechanism for learners to take notes

PEARLS Healthcare Debriefing Tool for Simulation leader

Additional supplies for in- person simulation set up: None.

Suggested time flow for the simulation: 10-15 minutes to ask for product attributes, then show the infographic with a brief review of those elements highlighted in the infographic.



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Describe content areas of the label. Select various elements of the label to review germicide type, contact time, safety, and use.

Simulation #3- Using disinfectant to wipe a surface

Description: This brief video shows a surface being wiped with a disinfectant. Fluorescent powder has been used as a marker simulating contamination. The surface is wiped using different techniques than a black light is used to demonstrate the impact of different mechanical wiping approaches.

Audience: In-person or virtual learners

Supplies Needed:

Video: Disinfecting a surface

Equipment to show video in-person or virtually

Live or virtual connection with learners

Mechanism for learners to take notes

PEARLS Healthcare Debriefing Tool for Simulation leader

Additional supplies for in- person simulation set up: Facilitator may elect to have a spray bottle, microfiber cloth, and a container of pop-up wipes to demonstrate different approaches to their use. In-person learners can see their own techniques and compare to those demonstrated in the video. This may be particularly helpful for individuals involved in cleaning and disinfecting reusable medical equipment such as nurses and environmental services personnel.

Suggested time flow for the simulation: Before showing the 3 minute video, ask learners two questions:

1. Applying a germicide to a piece of reusable medical equipment or room surface requires that the germicide come into contact with the entire surface for a specified period of time. This time is called: [contact or dwell time].
2. Mechanical friction, or wiping, of the surface helps expose all surfaces to the germicide. Wiping should be done: a. in a circular or back and forth motion with overlap to ensure complete contact; OR b. in a back and forth motion taking care to avoid going over the same areas so inadvertent recontamination of an area is prevented. The correct answer is b. There is no sound with the video

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so facilitators can stop and start to stress individual points. Allow additional 10 minutes for questions and answers along with discussion.

Show video- Using disinfectant to wipe a surface



Link to video:

https://www.dropbox.com/s/3wbsdxezyebl8gp/sim09142022_edited_09142022.mp4?dl=0

When viewing the video, point out the visual fluorescent ‘soil’ shown by the fluorescent dot on the item surface. Review importance of mechanical friction and ‘wetness’ of pop-up wipe. Review use of gloves when handling disinfectant and other PPE relevant to dilution process and various types of disinfectant solutions.

Simulation #4- application of Spaulding Classification to determine disinfection needs for reusable medical equipment

Description: This experience enables the learner to apply knowledge regarding the risk classification of items and their intended uses. A matching game resource is provided in the Appendices. This game lists items commonly used that all require cleaning and disinfection prior to reuse. The learner must identify the risk category (non-critical, semi-critical, critical) and identify the level of disinfection appropriate for that item. The resource included in the Appendices shows the table with the correct responses and the rationale.

Audience: In-person or virtual learners

Supply List: Simulation #4

Matching Game: Match reusable medical equipment to disinfection approach and Spaulding Classification

Equipment to show video in-person or virtually

Live or virtual connection with learners

Mechanism for learners to take notes

Additional supplies for in- person simulation set up: None, but samples of items could be available and the facilitator reviewing the intended use of the item and the appropriate level of disinfection necessary prior to reuse.

Suggested time flow for the simulation: 3 minutes for instructions and 7 minutes to complete the matching game. Additional 5 minutes for questions and discussion.

DEBRIEF

1. Set the scene by reviewing the simulation. Use the PEARLS Healthcare Debriefing Tool to open the discussion. Tools are provided in the Appendices.
2. Ask for reactions and use learner responses gathered during the Simulation discussion to probe further.
3. Describe situations in the scenario that seem to be points of confusion or discussion.
4. Analyze the simulation by asking some discussion questions:
 - a. What went well and what would you change?
 - b. Advocacy and Inquiry
 - i. State your observation and opinion
 - ii. Ask how the learner saw it
 - c. Provide constructive feedback to close gaps in knowledge
 - d. Prompts to consider
 - i. "What errors did you identify?"
 - ii. "What is the impact?"
 - iii. "What practices may prevent this issue?"
 - iv. "How far up the chain will you take this?"
 - v. "How can Human Factors Engineering be applied to this issue?"
5. Application and Summary
 - a. Take-away points
 - i. What did the learner take away?
 - ii. What were the key learning points from the instructors view?

Simulation #1 Debrief (Discussion)

Facilitators should focus on the following discussion points:

What does environmental contamination looks like?

How does environmental contamination occur?

When can contamination lead to transmission between patients, surfaces, and healthcare personnel?

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Why environmental cleaning and disinfection are important in reducing risk to patients and healthcare personnel

How to use cleaning and disinfection to reduce environmental contamination involving reusable medical equipment

Simulation #2 Debrief (Discussion)

Facilitators should focus on the following discussion points:

What information is included in the label?

How to use the disinfectant including contact time.

When should the disinfectant be used?

Why reading the label is important.

How to use the disinfectant to reduce environmental contamination involving reusable medical equipment

Simulation #3 Debrief (Discussion)

Facilitators should focus on the following discussion points:

How to use the disinfectant wipe to ensure contact with surface and contact time.

When a disinfectant wipe can be used.

Why appropriate number of wipes are important to disinfect the entire surface.

How to use the disinfectant wipe to reduce environmental contamination involving reusable medical equipment.

Simulation #4 Debrief (Discussion)

Facilitators should focus on the following discussion points:

How to use the Spaulding Classification to determine type of disinfectant and disinfection process to be used on reusable medical equipment.

When to perform cleaning and disinfection of reusable medical equipment.

Why reusable medical equipment poses a risk to patient safety and **Why** it must be cleaned and disinfected before use on another patient.

How to properly use disinfectants to clean and disinfect reusable medical equipment.

Key Take Home Points

During this learning activity, the focus has been on the need to ensure that reusable medical devices and equipment are cleaned and disinfected properly so they are not able to be part of pathogen transmission. Points to remember include:

- Environmental cleaning of reusable medical equipment is a patient safety responsibility of healthcare personnel as pathogens may contaminate equipment and serve as a vehicle of transmission to other patients.
- Equipment should be cleaned and disinfected between patients using an appropriate hospital-grade disinfectant as these germicides are selected to best address the types of organisms identified in healthcare settings.
- The Spaulding Classification should be used as a guide for determining how to disinfect equipment thereby enabling consistent and standardized approaches.
- Disinfectants should be used according to manufacturer instructions to ensure appropriate dilution, contact time, and use.
- Contact time helps ensure microorganisms are exposed to appropriate disinfectants for adequate time to kill and ultimately reduce transmission risk to patients and to healthcare personnel.

APPENDICES

Resource: Cleaning and Disinfection of Reusable Medical Equipment.

SIMULATION #2 READING A DISINFECTANT LABEL

Five important elements on a disinfectant label:

1. _____
2. _____
3. _____
4. _____
5. _____

Resource: Cleaning and Disinfection of Reusable Medical Equipment.

SIMULATION #2 READING A DISINFECTANT LABEL ANSWER KEY

Important elements on a disinfectant label:

- Active ingredients
- Contact time
- Safety and first aid
- Personal protective equipment
- Registration number
- Storage and disposal
- Directions for use
- Signal words

Resource: Cleaning and Disinfection of Reusable Medical Equipment.

SIMULATION #4: SPAULDING CLASSIFICATION AND DISINFECTION TYPE

Matching the type of disinfectant process for pieces of reusable medical equipment and surfaces in accordance with Spaulding Classification. Place an 'X' in the correct Spaulding Classification Category, then an 'X' in the corresponding Type of Disinfection Category. Use the example shown for Blood Pressure Cuff

Equipment or Surface	Spaulding Classification Category			Type of Disinfection		
	Non-Critical	Semi-Critical	Critical	Low-Level or Immediate Level Disinfection	High-Level Disinfection	Sterilization
Example: Blood Pressure Cuff	X Does not contact non-intact skin			X		
Surgical Instrument						
Patient bedrails						
Glucose meter						
Resident's wheelchair						
Laryngoscope blade						
Ultrasound probe checking for pulses						
Vaginal ultrasound probe						
Bedside commode						
IV pole						
Electronic thermometer						
Stethoscope used in isolation room						
Stethoscope used in patient/resident room not isolation						

Resource: Cleaning and Disinfection of Reusable Medical Equipment.

SIMULATION #4: SPAULDING CLASSIFICATION AND DISINFECTION TYPE- ANSWER KEY AND RATIONALE

Equipment or Surface	Spaulding Classification Category			Type of Disinfection		
	Non-Critical	Semi-Critical	Critical	Low-Level or Immediate Level Disinfection	High-Level Disinfection	Sterilization
Example: Blood Pressure Cuff	X-Does not contact non-intact skin			X		
Surgical Instrument			X-Contact with sterile body site			X
Patient bedrails	X-Does not contact non-intact skin			X		
Glucose meter	X-Does not contact non-intact skin			X		
Resident's wheelchair	X-Does not contact non-intact skin			X		
Laryngoscope blade		X-Contact with mucous membrane			X	
Ultrasound probe checking for pulses	X-Does not contact non-intact skin			X		
Vaginal ultrasound probe		X-Contact with mucous membrane			X	
Bedside commode	X-Does not contact non-intact skin			X		
IV pole	X-Does not contact non-intact skin			X		
Electronic thermometer	X-Does not contact non-intact skin			X		
Stethoscope used in isolation room	X-Does not contact non-intact skin			X		
Stethoscope used in patient/resident room not isolation	X-Does not contact non-intact skin			X		

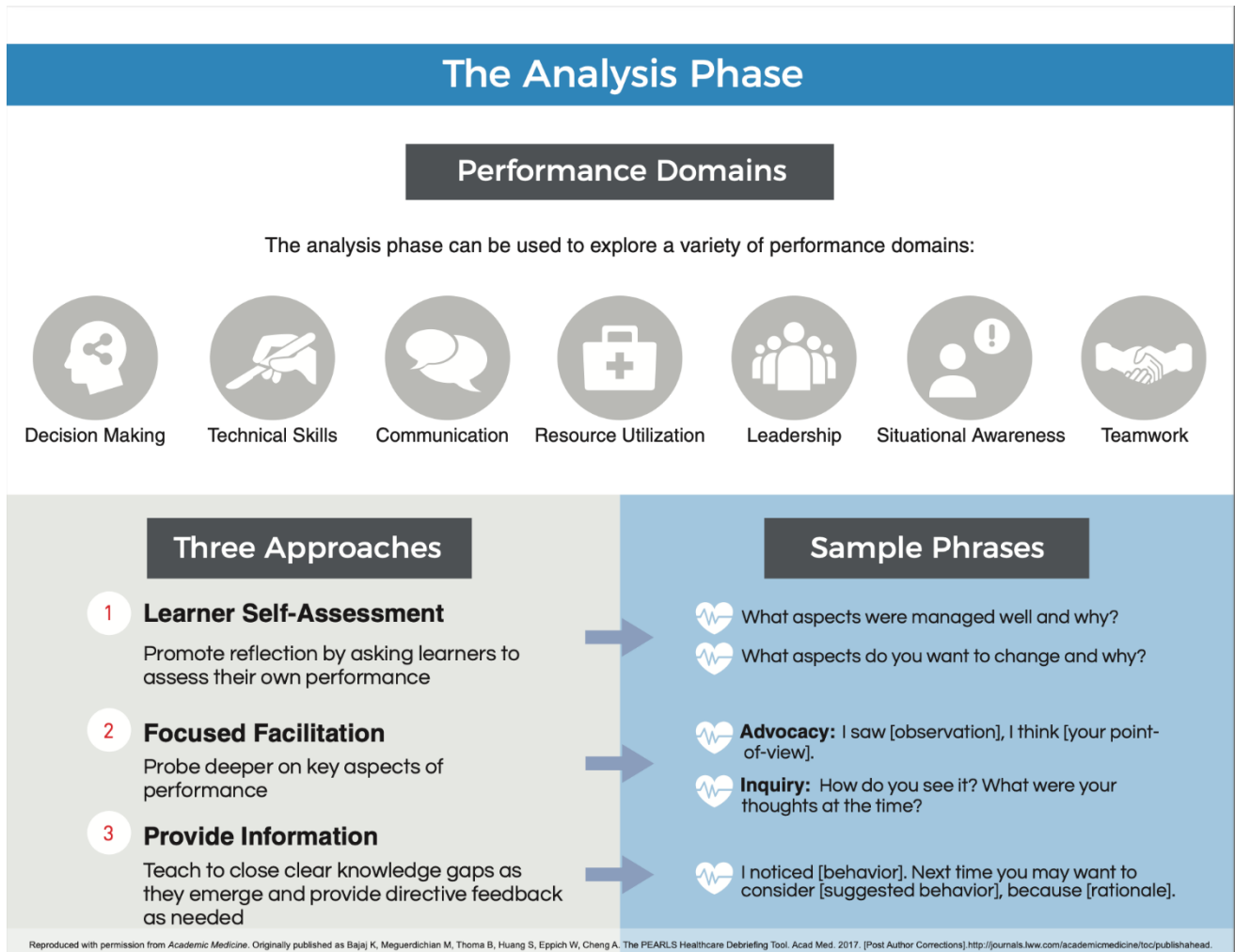
Resource: Post-Simulations: PEARLS for Debriefing

Use these Debriefing resources as a guide for the discussion. The Debriefing Tool provides the facilitator with how to approach the discussion enabling the learners to openly and safely discuss their approaches and ideas. The tool avoids judgmental statements and uses an approach of setting the scene for context learning and allowing learners to explore their reactions and how they perceive the situations.

The PEARLS Healthcare Debriefing Tool			
	Objective	Task	Sample Phrases
1 Setting the Scene	Create a safe context for learning	State the goal of debriefing; articulate the basic assumption*	"Let's spend X minutes debriefing. Our goal is to improve how we work together and care for our patients." "Everyone here is intelligent and wants to improve."
2 Reactions	Explore feelings	Solicit initial reactions & emotions	"Any initial reactions?" "How are you feeling?"
3 Description	Clarify facts	Develop shared understanding of case	"Can you please share a short summary of the case?" "What was the working diagnosis? Does everyone agree?"
4 Analysis	Explore variety of performance domains	See backside of card for more details	Preview Statement (Use to introduce new topic) "At this point, I'd like to spend some time talking about [insert topic here] because [insert rationale here]" Mini Summary (Use to summarize discussion of one topic) "That was great discussion. Are there any additional comments related to [insert performance gap here]?"
Any Outstanding Issues/Concerns?			
5 Application/Summary	Identify take-aways	Learner centered ----- Instructor centered	"What are some take-aways from this discussion for our clinical practice?" ----- "The key learning points for the case were [insert learning points here]."

*Basic assumption. Copyright © Center for Medical Simulation. Used with permission.
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The Analysis Phase tool helps the facilitator use a variety of approaches to explore the learner's abilities and performance during the simulation Debrief. The tool guides the facilitator through samples phrases that can be used to prompt and guide discussion.



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Project Firstline Interactive Activities

Check your infection control knowledge and gain valuable feedback in real time with interactive, educational infection control resources. These supplemental activities provide the facilitator and the learner to review Project Firstline activities and use them to augment topic learning.

Link to infographic: <https://www.cdc.gov/infectioncontrol/projectfirstline/healthcare/interactive-Infographic.html>

Where Germs Live in Healthcare Interactive Infographic

[Print](#)



Learn About Infection Control in Health Care

This printable lesson emphasizes the role reservoirs play in pathogen maintenance and transmission.

<https://www.cdc.gov/infectioncontrol/projectfirstline/healthcare/where-germs-live.html>

Additional Resources

Where Germs Live -Environment (Graphic)

This graphic depicts surfaces in the healthcare environment that may be involved in contamination and pathogen transmission. Suitable for sharing jpg with Twitter and Facebook communications.

<https://www.cdc.gov/infectioncontrol/projectfirstline/healthcare/videos-graphics.html>



Everyone Uses and Shares Devices in Healthcare.

This Gif demonstrates how shared devices may serve as transmission vehicles within healthcare settings.

<https://www.cdc.gov/infectioncontrol/projectfirstline/healthcare/videos-graphics.html>



Videos

Did You Know? Germs Spread Through Touch

This 17 second video available for viewing on YouTube the Web show the number of touches involving shared items in the healthcare environment and their subsequent involvement in pathogen transmission.

<https://www.cdc.gov/infectioncontrol/projectfirstline/healthcare/videos-graphics.html>

Cleaning and Disinfection Simulation Packet



Did You Know? Germs Can Live on Devices

This 16 second video available for viewing on YouTube and the Web demonstrate contamination of shared medical devices in healthcare.

<https://www.cdc.gov/infectioncontrol/projectfirstline/healthcare/videos-graphics.html>



EVALUATION

The evaluation method will involve determination of reaction (how learners felt about the experience), learning (did the learner gain knowledge from the experience), behavior (was the learner able to apply the knowledge), and results (impact of the training on learner's practice).

To gather evaluation information, the standard evaluation tool will be used for all Skill Stations learners within this series. An additional evaluation tool is available for sessions provided for facilitators.

Skills Stations Evaluation (Learner):

Simulation Topic: Cleaning and Disinfection Reusable Medical Equipment **Date:** __ \ __ \ ____

Circle your response to the following questions:

I was oriented to the purpose of this simulation experience.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
----------------	-------	-----------	----------	-------------------

The simulation experience was conducted in a skillful manner.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
----------------	-------	-----------	----------	-------------------

The simulation experience provided me with new knowledge.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
----------------	-------	-----------	----------	-------------------

The simulation experience provided me with an opportunity to apply my knowledge.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
----------------	-------	-----------	----------	-------------------

My current practice differed from that demonstrated during the simulation experience.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
----------------	-------	-----------	----------	-------------------

I intend to apply what I learned during the simulation experience.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
----------------	-------	-----------	----------	-------------------

My practice will change based upon what I learned during the simulation experience.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
----------------	-------	-----------	----------	-------------------

I found the simulation experience to be beneficial to my practice.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
----------------	-------	-----------	----------	-------------------

Comments:

Skills Stations Evaluation (Facilitator):

Simulation Topic: Cleaning and Disinfection Reusable Medical Equipment

Date: __ \ __ \ __

Circle your response to the following questions:

I was oriented to the purpose of this simulation experience.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
----------------	-------	-----------	----------	-------------------

I was provided with adequate information so I can conduct the simulation experience in a skillful manner.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
----------------	-------	-----------	----------	-------------------

The simulation experience provided me with new knowledge.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
----------------	-------	-----------	----------	-------------------

The simulation experience provided me with an opportunity to apply my knowledge.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
----------------	-------	-----------	----------	-------------------

My current practice differs from that demonstrated during the simulation experience.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
----------------	-------	-----------	----------	-------------------

I intend to apply what I learned during the simulation experience.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
----------------	-------	-----------	----------	-------------------

My teaching approach will change based upon what I learned during the simulation experience.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
----------------	-------	-----------	----------	-------------------

I found the simulation experience to be beneficial to my role.

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
----------------	-------	-----------	----------	-------------------

Comments:

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