# Infection Prevention and Control (IPC)

# Standard precautions: Hand hygiene

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# Contents

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## Standard precautions: Hand hygiene

Overview:

The hands of health care workers (HCWs) play a critical role in keeping the patients safe. If HCWs do not observe the hand hygiene at the right moments, using the proper methods, they can transmit infection-causing microorganisms through their hands from one patient to another. Performing hand hygiene at key moments is a significant health care intervention. Hand hygiene reduces the transmission of microorganisms (including those that are antibiotic-resistant), increases patient safety, and decreases healthcare-associated infection (HAIs). Practical, timely hand hygiene is a cornerstone of infection prevention and control.

Learning objectives: By the end of this course, participants should be able to:

- Describe the importance of hand hygiene being a critical component of infection prevention and control;
- Identification **5** critical moments for Hand Hygiene;
- Glove use and hand hygiene during patient care activities;
- Demonstration of step approach for safe handwashing with soap and water;
- Demonstration of step approach for safe handwashing with an alcohol-based hand rub (ABHR);
- Discuss key challenges and considerations of hand hygiene in a health care facility.

### Purpose of hand hygiene

In the health care environment, microorganisms, such as bacteria, viruses, and fungi, are transmitted through various routes. If not cleaned at the right moments, using the proper methods, the hands of HCWs play an important role in spreading microorganisms between patients. Timely hand hygiene also prevents contamination of the health care environment (e.g., linens, surfaces, patient care devices). The 5 Moments approach is designed to stop transmission at all of the key moments to keep patients safe.


The purpose of good hand hygiene is to remove soil, organic material, and transient microorganisms from the hands. It does not eliminate the resident flora that lives on the skin. During patient care, our hands become progressively colonized with microorganisms and potential pathogens. Lack of good hand hygiene practices increases the risk of contamination and is a threat to patient safety.

Hand hygiene is a general term that applies to either hand washing, hand rubbing (e.g., using an alcohol-based hand rub), or surgical hand antisepsis. Hand hygiene is a simple but important procedure, yet its importance is often overlooked, even by HCWs. Timely and effective hand hygiene protects the patient, health care workers, and the health care environment from being contaminated by microorganisms that could be harmful pathogens.

On average, healthcare providers wash their hands less than half of the times they should, by adhering to recommended hand hygiene practices, we can help protect patients by preventing infections from happening in the first place, and from spreading if they are already present. So, something that seems as simple as timely and effective hand hygiene can reduce the number of patients acquiring a healthcare-associated infection (HAIs). Fewer HAIs mean fewer resources spent on treating infections that could have been prevented, and ultimately, less morbidity and death. Fewer HAIs also reduces antibiotic use, which contributes to decreased antibiotic resistance. Therefore, hand hygiene is an essential health care intervention that saves both lives and money!

Healthcare workers should **reinforce** the importance of hand hygiene with patients, caretakers and visitors at every opportunity (options to support this, e.g. extra hand hygiene **points at entry**, extra health promotion staff, reminders.).

**Practice questions: Purpose of hand hygiene**

Now that you have learned about the role hand hygiene plays in limiting the spread of microorganisms, you decide to re-emphasize the purpose of hand hygiene with the surgical ward staff. Answer the following practice questions:

The medical resident asks, “I washed my hands once before the rounds. Isn’t that enough?” What is your response?

The nurse manager tells you that she does not understand how hand hygiene relates to HAIs. What do you tell her?

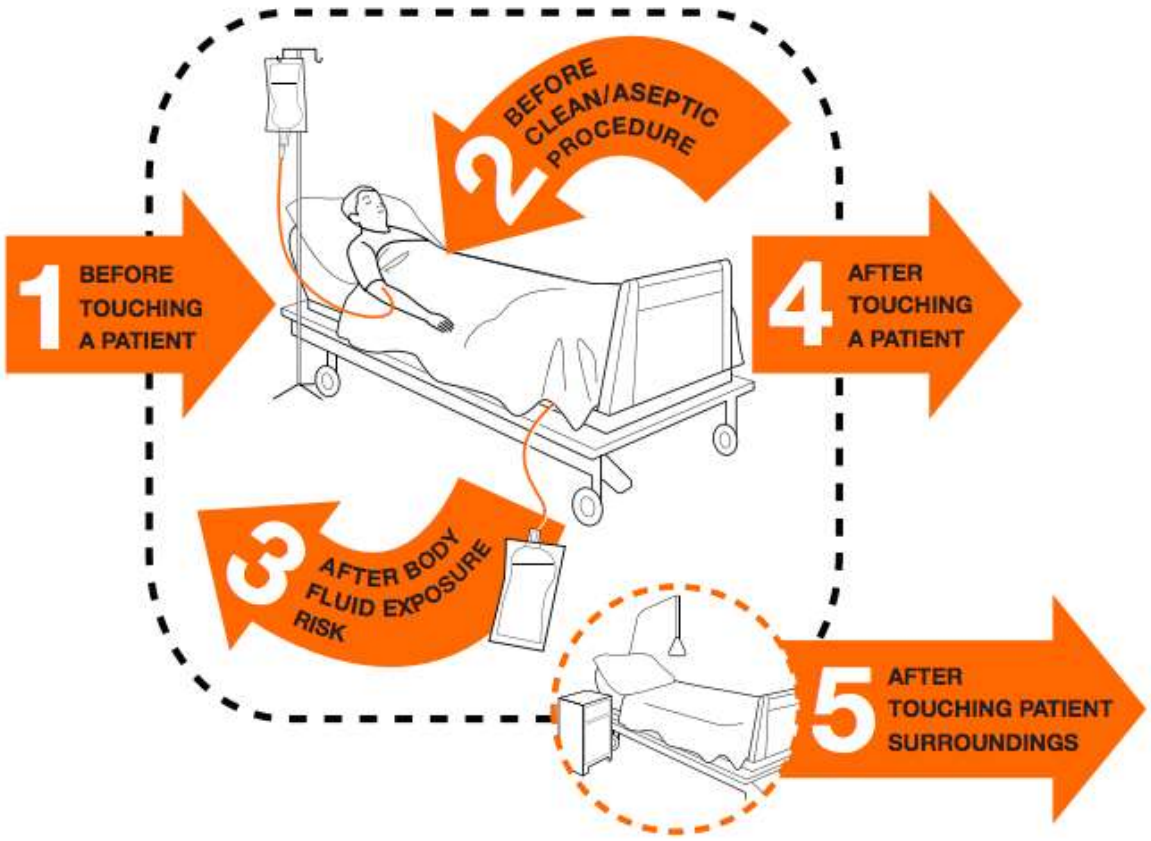
*Check with your facilitator to compare your answers.*

## Five Moments for hand hygiene

Health care workers should perform hand hygiene according to the World Health Organization’s (WHO) 5 Moments for Hand Hygiene. The guidance focuses on contact occurring within the *patient zone*[1]* during the delivery of patient care. It proposes a unified vision for all HCWs, trainers, and observers to improve understanding of critical times to

[1] *The patient zone includes the patient and some surfaces and items that are temporarily and exclusively dedicated to him/her (shown by the dotted line in the 5 Moments poster in Figure X-1). This typically includes the patient and all inanimate surfaces that are touched by or in direct physical contact with the patient, such as the bed rails, bedside table, bed linen, infusion tubing and other medical equipment. It further contains surfaces frequently touched by health care workers while caring for the patient, such as monitors, knobs and buttons, and other touch surfaces.*

clean hands. It merges all hand hygiene indications recommended by the WHO Guidelines on Hand Hygiene in Health Care and CDC's Guideline for Hand Hygiene in Health Care Settings into five moments when hand hygiene is required. Importantly, this user- and patient-centered approach aims for ease of use and integration into the natural workflow, which applies across a wide range of care settings and health care professions.




**Moment 1. Before touching a patient**: Wash your hands before physical interaction or performing a clean/aseptic procedure with a patient, when approaching him/her to protect the patient against harmful germs carried on your hands and vice versa. As a good practice, build the habit to wash your hands after several consultations.

**Moment 2. Before a clean/aseptic procedure:** Clean your hands immediately before accessing a critical site with infectious risk (isolation units) to protect the patient against harmful germs, including the patient's own, entering his/her body and vice versa.

**Moment 3. After body fluid exposure risk:** Clean your hands immediately after an exposure risk to body fluids, oral, and skin lesion care (and after glove removal). This will protect both you and the health care environment from pathogens in blood and body fluids.

**Moment 4. After touching a patient:** Clean your hands after touching a patient and his/her immediate surroundings, and when leaving the patient's side, to protect yourself and the health care environment from harmful microorganisms.

**Moment 5. After touching the patient's surroundings:** Clean your hands after touching any frequently touched object or furniture in the patient's immediate surroundings when leaving

– even if the patient has not been touched – to prevent the spread of harmful microorganisms from inside the patient zone to the rest of the health care environment.

## Gloves and hand hygiene

Glove use is an important barrier for protecting hands from cross contamination. If an HCW is wearing gloves, it does NOT mean that handwashing can be skipped. In other words, glove use does NOT replace the critical need for hand hygiene. Considerations for hand hygiene and glove use include:

- Gloves are worn when contact is anticipated with blood or other body fluids, mucous membranes, non-intact skin, potentially infectious material, or chemicals (such as cleaning solutions).
- Hand hygiene is performed before putting on the gloves, if hands are visibly dirty wash them with Soap and water.
- Remove gloves after caring for a patient. Do not wear the same pair of gloves for the care of more than one patient.
- When wearing gloves, perform hand hygiene during patient care if moving from a contaminated body site to another body site that is not contaminated (including a mucous membrane, non-intact skin, or a medical device within the same patient or the environment). An example of this is performing a wound dressing (non-intact skin) on the abdomen and then performing phlebotomy on the arm.
- Perform hand hygiene after glove removal. It is essential to know that hand contamination often occurs during glove removal due to poor technique and also, possibly, as a result of small, undetected holes in gloves. Hands that are not clean when reaching into a box of gloves can spread microorganisms throughout the glove box. Moreover, It's critical to perform hand hygiene before and after, is one reason why hand hygiene should always be performed before putting on and after taking off gloves.
- CDC suggests to change gloves and perform hand hygiene during patient care, if gloves become damaged, and gloves become visibly soiled with blood or body fluids following a task.

**Practice questions: Hand hygiene knowledge**

Now that you have discussed the importance of hand hygiene, can I ask a volunteer to show how they usually was their hands!

*Please repeat the exercise with couple of participants.*

## Cleaning hands with soap and water

The purpose of frequent handwashing with soap and water is to remove dirt and organic material and microorganisms from the hands. Soap assists the mechanical removal of debris, loosely adherent microbes, and substances containing fats and oils that are often present on soiled hands. Plain soaps have minimal, if any, antimicrobial activity, though the friction from rubbing hands while washing hands with plain soap and water can remove loosely adherent transient flora.

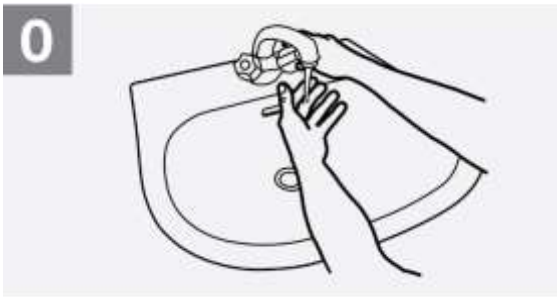
It is important to spend the correct amount of time on handwashing – washing hands for 30 seconds has been shown to remove 10 times the number of bacteria as washing them for 15 seconds. The entire handwashing procedure, if done correctly, should take 40 to 60 seconds.

Washing hands with **soap and water are recommended** in the following situations:

- If hands are visibly dirty or soiled or contaminated with blood or other body fluids.
- After use of the sanitation facility (toilet).
- When exposure to spore-forming pathogens, including outbreaks of *Clostridium difficile* (a bacterial infection that causes severe diarrhea), is suspected or proven, as the friction from washing hands with soap and water will physically remove spores from hands.
- Access points (entry and exit) at health facility.
- While in **communities visit**, if **soap is not available**, a solution of **0.05% chlorine solution** can be used, but this is not ideal as frequent use may lead to **dermatitis and risk of skin infection**. This is **not recommended for healthcare facilities**.

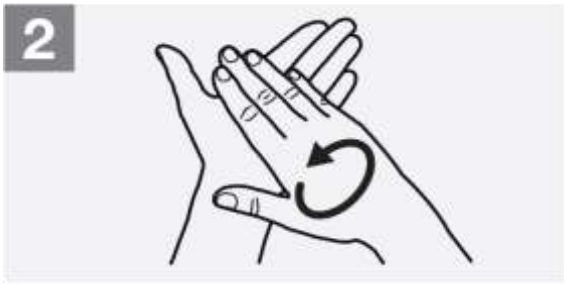
The following images explain step by step the proper way to wash hands with soap and water.

**0. Wet hands with water.**

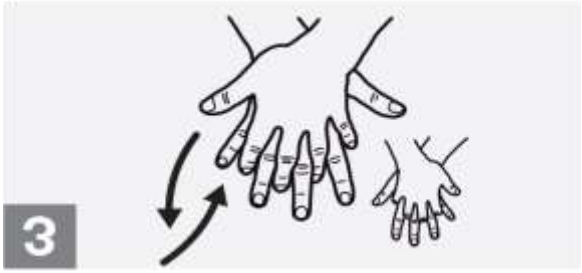



**1. Apply enough soap to cover all hand surfaces**

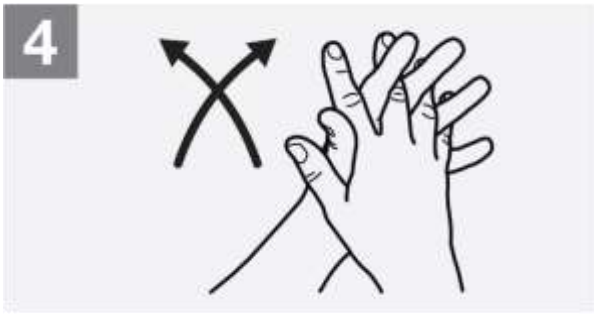
**2. Rub hands palm to palm.**



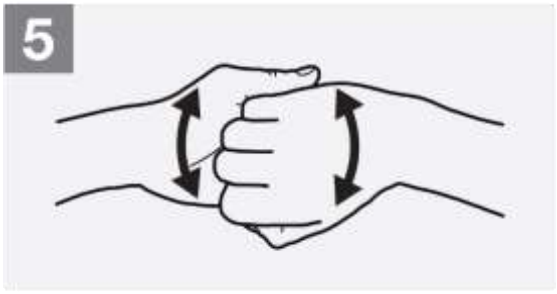

**3. Right palm over left dorsum with interlaced fingers and vice versa.**



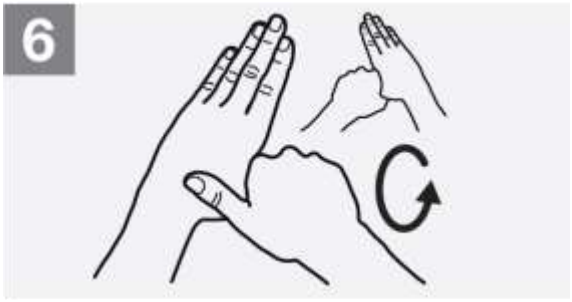

**4. Palm to palm with fingers interlaced.**



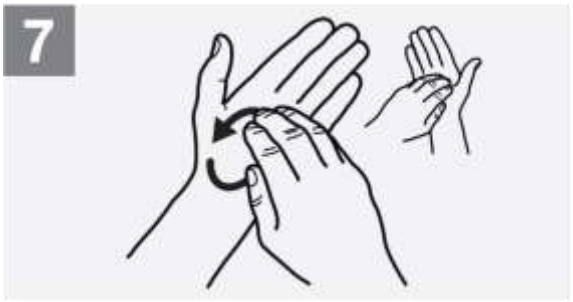

**5. Backs of fingers to opposing palms with fingers interlocked**




**6. Rotational rubbing of left thumb clasped in right palm and vice versa.**

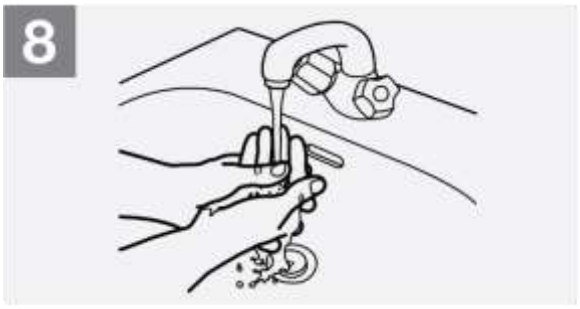


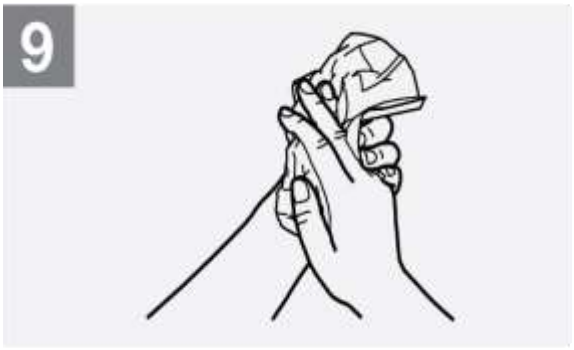

**7. Rotational rubbing, backward and forwards with clasped fingers of the right hand on left palm and vice versa**




**8. Rinse hands with water**

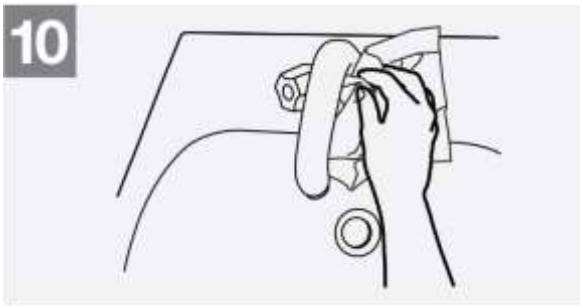
**9. Dry hands thoroughly with a single-use towel.**

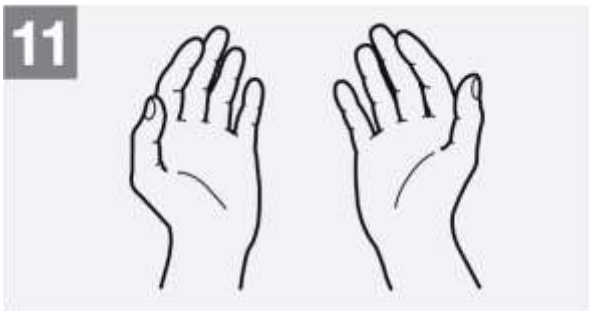



**10. Use a towel to turn off the faucet.**

**11. Your hands are now safe.**




(Show video soap and water)

## Practice with soap and water

Now that you have learned about the proper way to wash your hands, practice this technique. Have a co-worker look at the Checklist for Handwashing Using Soap and Water and observe as you wash your hands. Ask him or her to give you feedback, then answer the questions on the next page to check your understanding.

## Cleaning hands with alcohol-based hand rub (ABHR)

Alcohol-based hand rub is the preferred choice for hand hygiene if hands are not visibly soiled, because ABHR is more effective in killing microorganisms than plain or antimicrobial soaps and water, and it has other significant advantages. The alcohol in ABHR kills microorganisms by denaturing proteins (i.e., they dissolve some microbe components). It also has persistent activity, meaning that it takes longer for microorganisms to repopulate the hands.

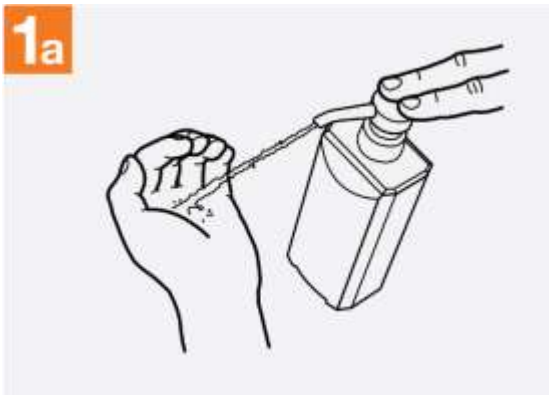
Hand hygiene with ABHR has advantages over hand hygiene with soap and water, including:

- It takes less time—only 20 to 30 seconds. In a very busy work environment, ABHR can save you time!
- ABHR can be placed directly at the point of care, making it convenient and easy to perform hand hygiene within your clinical workflow.
- Hand hygiene with ABHR does not need sinks, water, or towels—hands are air-dried.

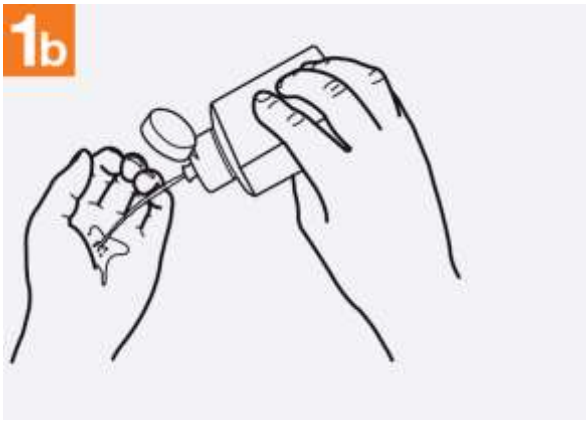
It is important to note that the active ingredient—alcohol—is flammable and that you should be careful and make sure any ABHR is stored away from flames.

The following images show the steps of how to use Alcohol-Based Hand Rub (ABHR) for hand hygiene.

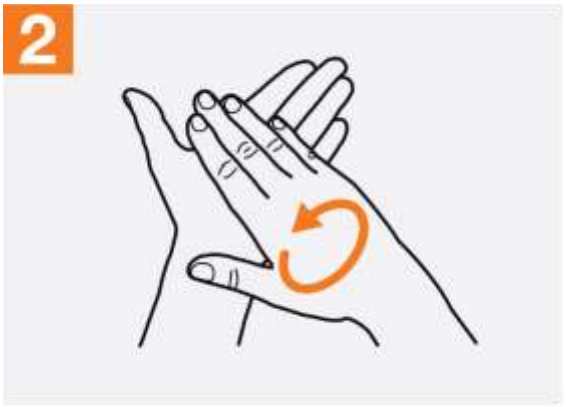
**1a. Apply a palmful of the product in a cupped hand, covering all surfaces**



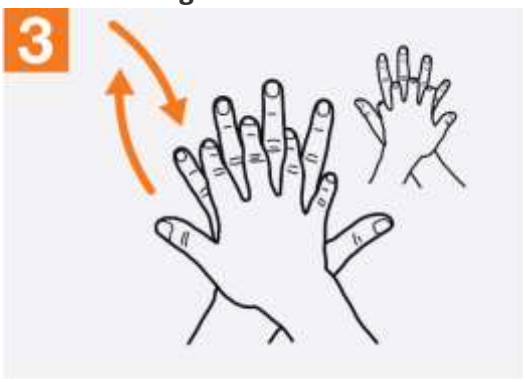

**1b. Apply a palmful of the product in a cupped hand, covering all surfaces**



**2. Rub hands palm to palm**

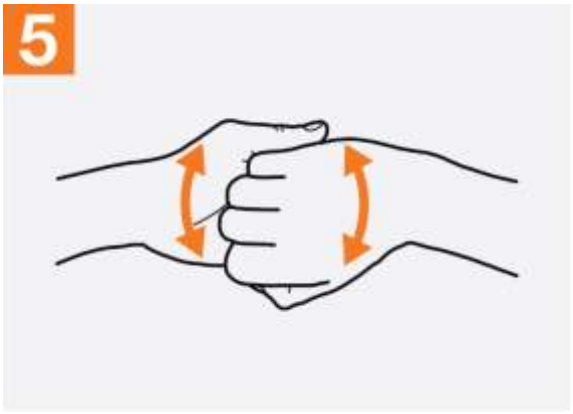



**3. Right palm over left dorsum with interlaced fingers and vice versa**




**4. Palm to palm with fingers interlaced**


**5. Backs of fingers to opposing palms with fingers interlocked**




**6. Rotational rubbing of left thumb clasped in right palm and vice versa**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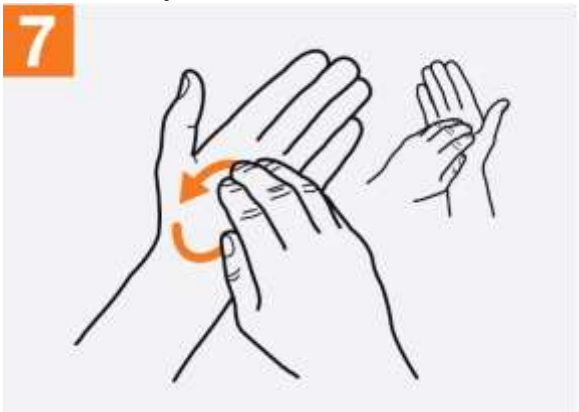



**8. Once dry, your hands are safe**

(Show video)

## Practice with alcohol-based hand rub (ABHR)

Now that you've learned about proper ABHR application, practice this technique. Have a co-worker look at the *Checklist for Hand Hygiene Using Alcohol-Based Hand Rub*, and observe you as you apply ABHR to your hands. Ask him or her to give you feedback, then answer the questions on the next page to check your understanding.

## Facilities without running water

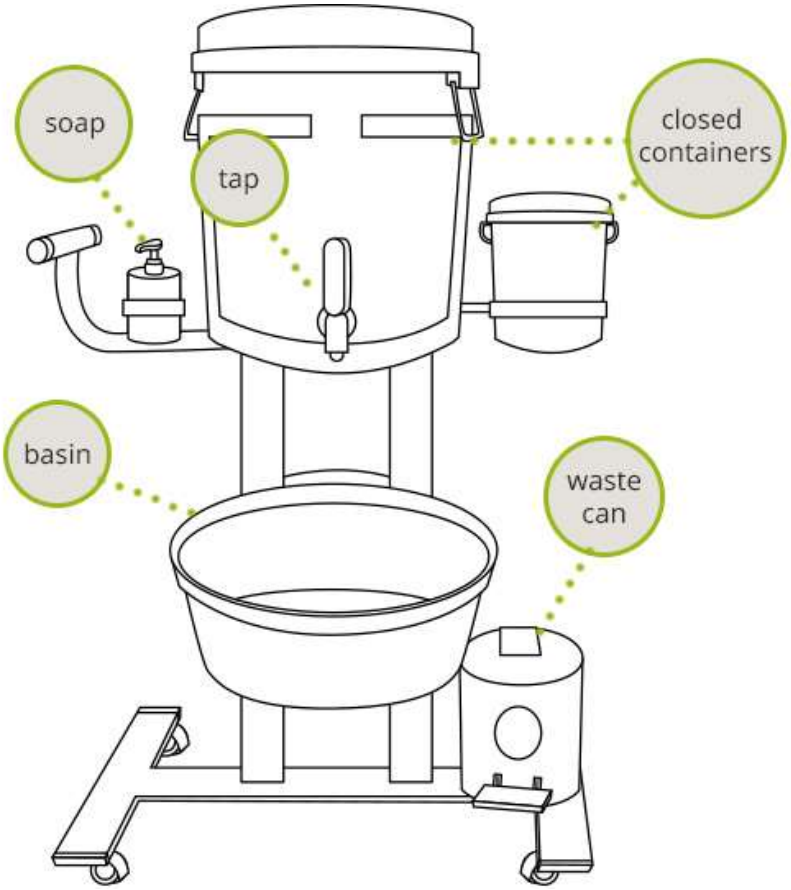
For facilities without running water, low-cost, locally made systems can help ensure water is available for hand washing. Hand hygiene stations should be available at access points both in clinical areas within the health care facility and in-service areas (sterilization, laboratory, kitchen, laundry, sanitation facilities, etc.). For hand washing, as long as soap is used, it is not necessary that the quality of water meets drinking standards – although efforts should be made to use clean potable water.

For systems with water in closed containers, avoid dipping hands or scooping into the container, as this can contaminate the water. Instead, someone should pour water over the user's hands. Soap should be positioned to ensure that water does not pool around it so that the soap can dry thoroughly. Soap can be placed on a grate, or hung in a net (socks) or with a rope.

For systems with a tap, it is preferable to stop the flow of water without using hands (e.g., long-handled taps that can be turned off with an elbow).

Soapy water has been shown to effectively **remove pathogens from hands** and be an acceptable and affordable alternative to **bar or liquid soap**. It can be used where soap is limited and can be a particularly practical solution for promoting soap use at public handwashing facilities. Soapy water can be created by diluting powdered laundry soap or liquid soap.

Thoroughly clean and dry containers and buckets daily to avoid the buildup of microorganisms. Extra units (containers and buckets) may be needed since the system will otherwise not be available for use while being cleaned.




## Additional considerations

### Lesions and Skin Breaks

To reduce the risks of skin reaction caused by frequent use of soap (such as contact dermatitis) and other skin damage, it is essential to promote good skin-care practices that help to maintain skin integrity, such as:

- Discouraging concurrent use of soap and ABHR
- Promoting ABHR to protect skin integrity (frequent handwashing with soap can lead to contact dermatitis)
- Providing alternative hand hygiene products for HCWs who have confirmed allergies or adverse reactions to standard products used in the health care facility.

- Cuticles, hands, and forearms should be free of major lesions (such as ulcer, abscess, and tumor) and cuts. Significant cuts and abrasions should be covered with waterproof dressings. If you have active lesions, do not provide direct patient care or participate in surgery until they are healed

## Fingernails, nail polish, and jewelry

Long fingernails, nail polish, and jewelry are impediments to hand hygiene and can promote bacterial growth on hands. Spaces or crevices under artificial or long nails and jewelry are hard to clean and limit access to those areas. Natural fingernails should be kept short, ideally not extending 0.5 cm (less than 1/4 inch) beyond the fingertips.

- Artificial nails or extenders are discouraged while working in clinical areas.
- If nail polish is worn, it should not be chipped.
- Wearing jewelry, including rings, is strongly discouraged. As an alternative, rings can be placed on a necklace around the neck.
- Surgical teams should remove jewelry, including rings, bracelets, and watches, before performing the surgical hand scrub.

## Hand lotions and creams

Hand lotions and creams should be used with caution. If used as a shared product, lotion and cream tubes can lead to cross-contamination. Hand lotions, creams, or moisturizing skincare products are used to minimize hand hygiene-related dryness and contact dermatitis due to frequent hand washing. Oil-based hand creams that contain petroleum jelly should not be used, because they may damage latex rubber gloves.

## Religious and cultural considerations

The health care facility's IPC team should have discussions with staff to identify and address any religious concerns regarding hand hygiene and the products used for hand hygiene. The IPC team should seek advice from religious leaders and provide alternatives that are religiously acceptable to the staff.

## Summary

Hand hygiene is a critical component of infection prevention and control. This module has detailed how performing hand hygiene at the right moments can help to prevent the spread of harmful microorganisms. By identifying and applying the WHO 5 Moments of Hand Hygiene in your health care facility, you can understand why hand hygiene must be performed at those critical moments. You can now demonstrate proper hand hygiene techniques with both soap and water and ABHR.

In this module, we have also discussed special considerations for facilities without running water, as well as other materials, substances, or beliefs that may impact hand hygiene in your facility. Understanding how to incorporate good hand hygiene practices in your facility will strengthen the efficiency of your IPC program.

Answers to practice questions: Purpose of hand hygiene

**The medical resident asks, "I washed my hands once before the rounds. Isn't that enough?" What is your response?**

While it is sensible to wash your hands at the start of rounds, this is not enough to stop the transmission of microorganisms – and not enough to stop them from entering critical sites with infectious risk for the patient. The 5 Moments is a simple approach designed to ensure that hands are cleaned as necessary for patient and HCW safety based on the risks of transmission. This is why it is important to clean hands at the right moment, using the proper methods.

**The nurse manager tells you that she does not understand how hand hygiene relates to HAIs. What do you tell her?**

HCWs touch patients, objects in their environment, and equipment repeatedly during their work. Because of this, potential pathogens can be picked up and carried on their hands, making it possible for HCWs to transmit microorganisms that can cause infection from one patient to another as they come into contact with patients and their immediate surroundings inside the patient zone. It is, therefore, imperative to think about and perform timely, effective hand hygiene to reduce the spread of HAIs.

## Resources

### Hand hygiene resources

*The following are additional hand hygiene resources. Whereas most are downloadable documents, one is a hyperlink to the WHO main website. This resource is labeled [Webpage hyperlink].*

- 2009 WHO guidelines on hand hygiene in health care provides health-care workers (HCWs), hospital administrators, and health authorities with a thorough review of evidence on hand hygiene in health care and specific recommendations to improve practices and reduce transmission of pathogenic microorganisms to patients and HCWs.
- A Guide to the Implementation of the WHO Multimodal Hand Hygiene Improvement Strategy helps in the development of local action plans to address hand hygiene improvement and sustainability.
- Guide to Local Production: WHO-recommended Hand rub Formulations is a practical guide for use at the pharmacy bench during the actual preparation of the formulation. Summarizes some essential background technical information.
- Protocol for Evaluation of Tolerability and Acceptability of Alcohol-based Hand rub in Use or Planned to be Introduced: Method 1 (revised August 2009)
- Protocol for Evaluation and Comparison of Tolerability and Acceptability of Different Alcohol-based Hand rubs: Method 2 (revised August 2009)
- Evidence of hand hygiene to reduce transmission and infections by multi-drug resistant organisms in health-care settings is a systematic review of the literature about hand hygiene.
- WHO Hand Hygiene Tools and Resources provides a range of tools to adopt and adapt to support local improvement in hand hygiene. [**Webpage hyperlink**]
- Hand Hygiene Technical Reference Manual was developed to assist health-care workers to implement improvements in their facility as part of a multi-modal strategy and following the WHO Guidelines on Hand Hygiene in Health Care.

### Posters

- 5 Moments for Hand Hygiene: Focus on caring for a patient with a postoperative wound
- See your hands
- Hand Hygiene and the Surgical Patient Journey
- How to Hand rub (outside of the operating room)
- How to Handwash (outside of the operating room)

**Assessment Tools**

- Hand Hygiene Self-Assessment Framework 2010 is a systematic tool with which to obtain a situation analysis of hand hygiene promotion and practices within an individual health-care facility.
- Hand Hygiene Observation Form is a tool for health care facilities to monitor hand hygiene practices of their staff.
- Soap/Hand rub Consumption Survey is a tool that provides a simple template to measure the consumption of products (e.g., soap and alcohol-based hand rubs) associated with implementing a hand hygiene improvement strategy.

**General**

- WHO Core Components support countries as they develop and execute their national antimicrobial resistance (AMR) action plans, among other aspects of health system strengthening.
- WHO Core Components Guidelines cover eight areas of IPC and comprise 14 recommendations and best practice statements.
- Improving Infection Prevention and Control at the Health Facility Guide is a practical manual that outlines how to implement the Core Component Guidelines.
- WHO Multimodal Strategy consists of several elements (3 or more; usually 5) implemented in an integrated way to guide action and provide a clear focus for the implementer.
- WHO Infection Prevention and Control Assessment Framework (IPCAF) is a tool that can provide a baseline assessment of IPC program activities within a health care facility as well as ongoing evaluations through repeated administration to document progress over time.
- Interim Practical Manual Supporting National Implementation of the WHO Guidelines on Core Components of Infection Prevention and Control Programmes is a resource to strengthen IPC and improve the quality and safety of health service delivery through the establishment of evidence-based and locally adapted integrated IPC programs.
- Report on the Burden of Endemic Health Care-Associated Infection Worldwide presents the evidence available from the scientific literature on the endemic burden of the most frequent types of HCAIs and it provides an assessment of epidemiological differences among countries according to income levels. The report also aims to identify major obstacles and gaps to assess the magnitude of the HCAI burden worldwide and to identify solutions and future perspectives for improvement.