Devote time with your team to quiz the basics of proper hand hygiene.

TEAM HUDDLE: Hand Hygiene - Understanding Your Responsibility for Infection Prevention and Control

Dental infection prevention and control (IPC) is a system of policies and procedures designed to ensure the use of best practices to enhance safety and reduce the risk of transmitting potentially dangerous microbes. An effective IPC program hinges on assuring the quality of the preventive policies and procedures. This issue initiates a review of basic IPC procedures by re-emphasizing the importance of hand hygiene. It also provides information on COVID-19.

LEARNING OBJECTIVES

After reading this publication, the reader should be able to:

- state the principles of IPC involving hand hygiene.
- describe how skin microbes are involved in spreading diseases.
- discuss how hand hygiene interferes with the spread of skin microbes.
- describe when to perform hand hygiene.
- describe how to perform hand hygiene.
Dr. Nobel, an orthodontist, sees about 50 patients a day and has three relatively new office staff. The office is ready for its quarterly review of the inventory, availability, and cost of consumable supplies such as hand hygiene, disinfecting, sterilizing, and waterline products, disposables, personal protective equipment and other items.

So, as an initial approach, Dr. Nobel asked the office staff to provide ideas on how to reduce office expenses concentrating first on hand hygiene procedures. The staff was encouraged not to be afraid to “think out of the box,” for each idea will be carefully reviewed.

They came up with the following suggestions.

1. Eliminate all handwashing and use only alcohol-based hand rubs (ABHR).
2. After each patient appointment check the exam gloves for tears and, if they look OK, treat them with an alcohol hand rub or antimicrobial soap for use on the next patient.
3. Use jet air dryers after handwashing.
4. Use the surface disinfectant wipes to wipe our hands instead of using alcohol hand rubs.
5. Stop hand hygiene before gloving.

(continued on page 3)
1. Eliminate all handwashing and use only alcohol-based hand rubs (ABHR).

Analysis of the suggestion
This suggestion would save on hand soap, towels, water, and time. However, handwashing with soap and water rather than ABHR is necessary if hands are visibly soiled. Also, with the routine use of ABHR it’s important to periodically wash with soap and water to remove dead microbes, perspiration, glove chemicals, and any material that may have leaked through glove tears.

WHAT: The Centers for Disease Control and Prevention (CDC) recommend using ABHR with at least 60% alcohol or wash hands with soap and water for at least 20 seconds. If hands are visibly soiled, use soap and water before returning to ABHR.

WHY: Proteinaceous material in blood or saliva may interfere with the antimicrobial action of alcohols.

HOW: Check hands for visible soil before hand hygiene.

2. After each patient appointment check the exam gloves for tears and, if they look OK, treat them with an alcohol hand rub or antimicrobial soap for use on the next patient.

Analysis of the suggestion
Gloves are single use items. Reusing gloves violates CDC recommendations and the Bloodborne Pathogens Standard from the Occupational Safety and Health Administration (OSHA). Not changing gloves between patients promotes cross-contamination from patient to patient.

WHAT: The CDC specifically indicates not to wear the same pair of gloves for more than one patient and not to wash gloves, gloves are not to be reused. OSHA states that disposable (single use) gloves shall not be washed or decontaminated for re-use.

WHY: Gloves are highly contaminated after contact with a patient’s mouth and would certainly cause cross-contamination if reused.

In addition, since gloves are not to be reused, there is a paucity of scientific information on the ability of alcohol or detergents to actually decontaminate the gloves.

Treatment of the gloves with alcohol or detergent may weaken stabilizers in the glove material or enhance penetration (causing wicking) of material through inherent defects.

If gloves are kept on for extended times, the normal skin microbes beneath the gloves will multiply and could cause skin irritation.

HOW: Use a fresh pair of medical/dental gloves for each patient. Do not try to decontaminate gloves for reuse.

(continued on page 4)
3. Use jet air dryers after handwashing.

Analysis of the suggestion
This will save on paper towels, but the best way to dry hands after handwashing remains unclear because few studies about hand drying exist, and the results of these studies conflict. One thought is that using a jet air dryer may cause unnecessary contamination of the cleaned hands by drawing in room air (which contains microbes on dust and from environmental surfaces) and blowing those microbes directly on the hands. Also, jet air may dislodge any remaining bacteria from the hands causing more airborne contaminants.

WHAT: The Association for the Advancement of Medical Instrumentation (AAMI) has developed an American National Standard on steam sterilization and sterility assurance. A portion of this standard relates to air flow in healthcare facilities stating that “fans should not be permitted in any sterile processing area.” Thus, air dryers re-contaminate cleaned hands.

WHY: “Fans (including jet air dryers) create highly turbulent air flow, which recirculates dust and microorganisms from the floor and work surfaces and thus interferes with designed airflow characteristics.”

HOW: Use disposable paper towels to dry the hands after handwashing.

4. Use the surface disinfectant wipes to wipe our hands instead of using alcohol hand rubs.

Analysis of the suggestion
Most importantly, surface disinfectant wipes could damage the skin and are not designed or promoted for use on the skin.

WHAT: For hand hygiene the CDC states to use either a nonantimicrobial (plain soap) or an antimicrobial soap and water when hands are dirty or contaminated with blood or other potentially infectious material (e.g., saliva). If hands are not visibly soiled, an ABHR can also be used.

WHY: Using products not designed for use on the skin (e.g., surface disinfectants) could damage the skin, and it’s a violation of Federal law to use an Environmental Protection Agency (EPA) registered product (e.g., a surface disinfectant) in a manner inconsistent with its labeling.

HOW: Follow the CDC recommendation for hand hygiene.

5. Stop hand hygiene before gloving.

Analysis of the suggestion
This would save time and hand hygiene agents, but it violates CDC recommendations and increases the chances of skin irritation beneath the gloves.

WHAT: The CDC recommends performing hand hygiene before donning gloves and after removing gloves.

WHY: As one wears gloves the skin on the hands becomes warmer and moist from perspiration. These factors enhance growth of the normal skin bacteria and any other bacteria that may have contaminated the hand through glove defects.

The by-products of bacterial growth (e.g., acids, histolytic enzymes, endotoxins, cytotoxic chemicals such as hydrogen sulfide (H2S) and ammonia) could irritate the skin. When hands are not cleaned after removing gloves prior to accessing fresh gloves, the new gloves become contaminated while accessing and during donning.

HOW: Follow CDC recommendations.
HAND HYGIENE: DETAILS and STRATEGIES

Microbes on the hands
Levels of bacteria on the adult skin have been estimated at between 600 and 20 million per square centimeter (about the size of the little finger’s nail). Resident microbes on the hands are those that have colonized (adhered and survived on) the skin. They live there all the time, and are never completely removed even by surgical scrubs because they can occur in the lower layers of the skin.

This flora is important in maintaining human health as these organisms can resist colonization of the skin from invading pathogens. Although the resident bacteria could cause infections if transferred to others, they are much less important in causing infections than the transient microbes on the skin.

Transient microbes on the hands are those that are picked up by contact (touching) with contaminated surfaces. These microbes do not colonize the skin and are easily transferred by touching other body sites, other people, or environmental surfaces.

The hands and disease spread
Fortunately, since the transient microbes do not colonize (adhere to) the lower layers of the skin, they remain on the skin surface and can be easily removed or greatly reduced by hand hygiene.

Thus, the purpose of hand hygiene is to remove or kill transient skin microbes and reduce the spread of potential pathogens via direct contact (touching human surfaces) and indirect contact (touching inanimate surfaces).

Hand hygiene is related to two principles of IPC.8

1. Take action to stay healthy – Hand hygiene before gloving decreases the transient microbes on the hands so there will be fewer to multiply beneath gloves and irritate the skin. Hand hygiene after removing gloves removes any microbes that have multiplied beneath the gloves, any that may have contaminated the hands during the process of removing the gloves, and any from a patient that may have penetrated the gloves. It reduces the number of microbes that can be transferred by touching your other body surfaces.

2. Limit the spread of contaminants - Hand hygiene before gloving reduces the number of microbes that may contaminate new gloves and that may infect the patient by leaking through tears or inherent defects in the glove material. Hand hygiene after removing gloves and at other times reduces the spread of potential pathogens to your other body sites, to other people, and to environmental surfaces.

(continued on page 6)
When to perform hand hygiene

The Division of Oral Health at CDC has stated to always perform hand hygiene in the following health-care situations:

- Before and after treating each patient (e.g., before and after gloving)
- After touching (with bare hands) instruments, equipment, materials, and other objects that are likely to be contaminated by blood, saliva, or respiratory secretions
- Before leaving the dental treatment area
- When hands are visibly soiled
- Before regloving and after removing gloves that are torn, cut, or punctured

There are other key times to perform hand hygiene.

(Keeping Hands Clean | Handwashing | Hygiene | Healthy Water | CDC)

- Before, during, and after preparing food
- Before and after eating food
- Before and after caring for someone at home who is sick with vomiting or diarrhea
- Before and after treating a cut or wound
- After using the toilet
- After changing diapers or cleaning up a child who has used the toilet
- After blowing your nose, coughing, or sneezing
- After touching an animal, animal feed, or animal waste
- After handling pet food or pet treats
- After touching garbage

Hand hygiene process using an ABHR

Unless hands are visibly soiled (e.g., dirt, blood, body fluids), an ABHR with at least 60% alcohol is preferred over soap and water in most clinical situations because it:

- is more effective than soap at killing potentially deadly germs on hands;
- requires less time;
- is more accessible than handwashing sinks;
- produces reduced bacterial counts on hands; and
- improves skin condition with less irritation and dryness than soap and water (the solution contains emollients).

When using ABHR vigorously rub the hands together until they are dry (about 20 seconds). Be sure to use enough solution to last for 20 seconds until dry.
Hand hygiene process using soap and water

Steps for cleaning your hands with soap and water are: wet the hands, lather, scrub, rinse, and dry.

Wet your hands first with water; apply the amount of product recommended by the manufacturer to your hands and rub your hands together to generate a lather covering all surfaces of the hands and fingers; vigorously scrub your hands for at least 20 seconds covering all surfaces of the hands and fingers; rinse your hands with clean running water; use disposable towels to dry. Use a towel to turn off the faucet. Avoid using hot water to prevent drying of skin.

The World Health Organization (WHO) has a good pictogram showing their 40-60 second routine handwashing technique. (See page 8 to view resource.)

Hands free faucets that are activated using foot, knee, or “electric eye” motion are preferred in healthcare facilities.

Before surgery use a surgical scrub with an antibacterial soap and water, rinse, and dry OR use a nonantibacterial soap and water for the surgical scrub, rinse, dry the hands, and use an ABHR.

Other aspects of hand hygiene

- Hands free soap dispensers, faucets, and paper towel dispensers help reduce cross-contamination.
- Store liquid hand soaps in disposable closed containers or closed containers that can be washed before refilling.
- Do not “top off” partially empty reusable soap containers for this can perpetuate any previous contamination inside the container. Wash then refill the container. With pump dispensers the up-stroke (return action) draws in microbe-laden air which contaminates the solution.
- Do not use hand lotions during the day that contain a base of petroleum, lanolin, mineral oil, palm oil, or coconut oil for they may have detrimental effects on the integrity of gloves. Use water-based lotions or use the oily lotions at the end of the day.
- Alcohol-based hand sanitizers (ABHS) contain ethyl alcohol, which readily evaporates at room temperature into an ignitable vapor, and is considered a flammable liquid. Follow fire-safety rules when using and storing these products. (Fire Safety and ABS | Hand Hygiene | CDC)
- Fingernail care and jewelry
  - Microbes can live under artificial fingernails both before and after using an alcohol-based hand sanitizer and handwashing.
  - CDC recommends that healthcare providers do not wear artificial fingernails or extensions when having direct contact with patients at high risk (e.g., those in intensive-care units or operating rooms). Gel nails are not recommended.
  - Keep natural nail tips less than ¼ inch long.
  - Some studies have shown that skin underneath rings contains more germs than comparable areas of skin on fingers without rings.
How to Handwash?

WASH HANDS WHEN VISIBLY SOILED! OTHERWISE, USE HANDRUB

**Duration of the entire procedure:** 40-60 seconds

1. Wet hands with water;
2. Apply enough soap to cover all hand surfaces;
3. Rub hands palm to palm;
4. Right palm over left dorsum with interlaced fingers and vice versa;
5. Palm to palm with fingers interlaced;
6. Backs of fingers to opposing palms with fingers interlocked;
7. Rotational rubbing of left thumb clasped in right palm and vice versa;
8. Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;
9. Rinse hands with water;
10. Dry hands thoroughly with a single use towel;
11. Use towel to turn off faucet;
12. Your hands are now safe.

COVID-19 INFORMATION

What we know about COVID-19 changes rapidly, so you are encouraged to seek further details about the information given below by reviewing the CDC Website and the references cited.

COVID-19 and Hand Hygiene

Frequent hand hygiene, including handwashing with soap and water or using a hand sanitizer containing ≥60% alcohol when soap and water are not readily available, is one of several critical prevention measures recommended to reduce the spread of SARS-CoV-2, the virus that causes coronavirus disease 2019 (COVID-19). (How to Protect Yourself & Others | CDC)

Who does not need to quarantine?

On January 27, 2022, the CDC clarified aspects of COVID-19 quarantining as follows: (COVID-19 Quarantine and Isolation | CDC).

If you came into close contact with someone with COVID-19 and you are in one of the following groups, you do not need to quarantine.

- You are up to date with your COVID-19 vaccines.
- You had confirmed COVID-19 within the last 90 days (meaning you tested positive using a viral test).

You should wear a well-fitting mask around others for 10 days from the date of your last close contact with someone with COVID-19 (the date of last close contact is considered day 0). Get tested at least 5 days after you last had close contact with someone with COVID-19. If you test positive or develop COVID-19 symptoms, isolate from other people and follow recommendations in the Isolation section below. If you tested positive for COVID-19 with a viral test within the previous 90 days and subsequently recovered and remain without COVID-19 symptoms, you do not need to quarantine or get tested after close contact. You should wear a well-fitting mask around others for 10 days from the date of your last close contact with someone with COVID-19 (the date of last close contact is considered day 0).

Who should quarantine?

If you come into close contact with someone with COVID-19, you should quarantine if you are not up to date on COVID-19 vaccines. This includes people who are not vaccinated.

What to do for quarantine? See COVID-19 Quarantine and Isolation | CDC.
Team Huddle Discussion Guide

1. What are the hand hygiene policies in your facility?
2. When should you perform hand hygiene?
3. How should you perform hand hygiene and what products should be used?
4. How does hand hygiene actually prevent disease spread from the hands?
5. Where do the microbes that are spread from the hands come from?

KEY TAKEAWAYS

1. Hands are critical vectors in spreading disease.
2. Hand hygiene technique is very important.
3. Taking short-cuts with hand hygiene can cause real problems.

Take the Silent Video Challenge!

Can you identify the actions in this short video that compromise asepsis when handwashing with soap and water? [https://youtu.be/vZceCpAS5JM](https://youtu.be/vZceCpAS5JM)

The Scenario: Handwashing

The Lesson: The dental healthcare personnel (DHCP) breaches asepsis by using cleanly washed hands to shut off the water from the faucet. After handwashing and rinsing, a disposable towel should be used to dry the hands, and subsequently the towel is used to turn off the water faucet. Ideally a hands-free faucet should be used.
What’s Wrong With This Picture?

Can you identify the infection prevention shortfall as this DHCP prepares for patient treatment?

**Answer:** It appears the DHCP is washing a single-use glove in order to use or reuse it. The CDC specifically indicates not to wear the same pair of gloves for more than one patient and not to wash gloves, gloves are not to be reused. OSHA states that disposable (single use) gloves shall not be washed or decontaminated for re-use. If gloves are kept on for extended times, the normal skin microbes beneath the gloves will multiply and could cause skin irritation.

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**QUESTIONS TO ONLINE QUIZ:**
**Select the most correct answer**

1. Why is it important to wash the hands before gloving?
   a. Dirty hands will increase the chances that the gloves will tear during use.
   b. The small amount of soap left on the hands after handwashing prevents any allergic reaction to the gloves.
   c. The residual moisture from handwashing makes the gloves easier to put on.
   d. This reduces the number of microbes on the skin so there will be fewer to multiply beneath the gloves and irritate the skin.

2. Which of the following is the correct hand hygiene procedure for using an alcohol-based hand rub (ABHR) before surgery?
   a. Use the ABHR; rinse; dry
   b. Scrub with a nonantimicrobial soap; rinse; dry; use the ABHR
   c. Scrub with a nonantimicrobial soap; use the ABHR; rinse; dry
   d. Use the ABHR; scrub with nonantibacterial soap; rinse; dry

3. What is the proper nonsurgical hand hygiene procedure when the hands are contaminated with saliva?
   a. Handwashing with soap and water; rinse, dry
   b. Handwashing with soap and water; dry
   c. Alcohol hand rub; rinse; dry
   d. Alcohol hand rub

4. What interferes with the antimicrobial action of ABHR?
   a. Soap
   b. Water
   c. Disinfectants
   d. Proteinaceous material

5. Petroleum-based hand lotions can damage/destroy:
   a. antimicrobial soap.
   b. nonantimicrobial soap.
   c. gloves.
   d. alcohol.

6. During handwashing the CDC would like for you to vigorously scrub your hands for at least:
   a. 5 seconds.
   b. 10 seconds.
   c. 15 seconds.
   d. 20 seconds.

7. CDC recommends to use alcohol hand rubs containing no less than what percent of alcohol?
   a. 10
   b. 25
   c. 60
   d. 95

8. Four government agencies heavily involved in infection prevention and control are the Occupational Safety and Health Administration (OSHA), the Food and Drug Administration (FDA), the Environmental Protection Agency (EPA), and the Centers for Disease Control and Prevention (CDC). What two agencies state that patient care gloves are not to be reused on another patient?
   a. OSHA and EPA
   b. CDC and OSHA
   c. EPA and FDA
   d. CDC and EPA

9. How does hand hygiene interfere with disease spread?
   a. It always kills all microbes on the hands
   b. It removes or kills the transient microbes on the hands
   c. It stimulates the resident microbes to kill the transient microbes
   d. It promotes the growth of the transient microbes which in turn kill the resident microbes

10. A 50 year-old man who received two doses and a booster of the Pfizer-BioNTech vaccine was exposed to a person with confirmed COVID-19. According to the CDC, how long does the man have to stay in quarantine?
    a. 15 days
    b. 10 days
    c. 5 days
    d. 0 days

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QUICK BITES

FROM THE Editor’s Desk

Find a COVID-19 vaccine near you

Go to: Vaccines.gov or
Text your ZIP code to 438829 or
Call 1-800-232-0233
Find COVID-19 Vaccines & Boosters

(Visit Vaccines.gov to find a vaccination site near you. Available in English, Spanish, and many other languages.
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youtu.be/TnL6qierYNY

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