HealthStream Regulatory Script

Hand Hygiene

Version: [May 2006]

Lesson 1: Introduction
Lesson 2: Background & History
Lesson 3: Importance of Hand Hygiene
Lesson 4: Handwashing & Hand Antisepsis
Welcome to the introductory lesson on hand hygiene.

As your partner, HealthStream strives to provide its customers with excellence in regulatory learning solutions. As new guidelines are continually issued by regulatory agencies, we work to update courses, as needed, in a timely manner. Since responsibility for complying with new guidelines remains with your organization, HealthStream encourages you to routinely check all relevant regulatory agencies directly for the latest updates for clinical/organizational guidelines.
Course Rationale

According to the CDC, proper hand hygiene is the single most important way to stop the spread of infection.

This course will teach you how to do your part in:
- Promoting proper hand hygiene
- Helping to prevent the spread of infection in your facility

You will learn about:
- The history of hand hygiene
- Why hand hygiene is so important
- How to keep your hands as clean and germ-free as possible
## Course Goals

After completing this course, you should be able to:
- List important milestones in the history of hand hygiene.
- Recognize why hand hygiene in the healthcare setting is so important.
- Identify best practices for hand hygiene.
### Introduction

This introductory lesson gives the course rationale, goals, and outline.

Lesson 2 gives a brief background and history on hand hygiene.

Lesson 3 discusses the importance of hand hygiene in the healthcare setting.

Finally, lesson 4 describes best practices for hand hygiene.

---

<table>
<thead>
<tr>
<th>Course Map</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lesson 1: Introduction</strong></td>
</tr>
<tr>
<td><strong>Lesson 2: Background &amp; History</strong></td>
</tr>
<tr>
<td>- Early experiences with hand hygiene</td>
</tr>
<tr>
<td>- Hand hygiene guidelines</td>
</tr>
<tr>
<td><strong>Lesson 3: Importance of Hand Hygiene</strong></td>
</tr>
<tr>
<td>- HAI</td>
</tr>
<tr>
<td>- Bacterial flora</td>
</tr>
<tr>
<td>- Risk of contamination &amp; cross-contamination</td>
</tr>
<tr>
<td><strong>Lesson 4: Handwashing &amp; Hand Antisepsis</strong></td>
</tr>
<tr>
<td>- Hand hygiene products</td>
</tr>
<tr>
<td>- Soap &amp; water</td>
</tr>
<tr>
<td>- Alcohol rubs</td>
</tr>
<tr>
<td>- Surgical hand hygiene</td>
</tr>
<tr>
<td>- Other hand hygiene practices</td>
</tr>
</tbody>
</table>
### Lesson 2: Background & History

#### Introduction & Objectives

Welcome to the lesson on background and history of hand hygiene.

After completing this lesson, you should be able to:
- Recognize early clinical experiences with hand hygiene.
- Identify key steps in the development of hand hygiene.

---

**FLASH ANIMATION: 2001.SWF/FLA**

**Lesson map**

- Early experiences with hand hygiene
  - Ignaz Semmelweis
  - Soap and water vs. chlorine solution
- Hand hygiene guidelines
  - Early guidelines
  - 1995 HICPAC guidelines
  - Current CDC guidelines
In the 1800s, medical professionals first saw evidence of the importance of hand decontamination.

In 1846, Ignaz Semmelweis noticed that many women developed *childbed fever* and died after delivering babies in the clinic in Vienna where he worked.
<table>
<thead>
<tr>
<th><strong>2003</strong></th>
<th>Cadaverous Particles</th>
</tr>
</thead>
</table>
| Semmelweis also noticed that physicians and students had an odor on their hands when they left the autopsy area. He guessed that healthcare workers were carrying “cadaverous particles” from dead bodies to obstetric patients. He thought these particles must carry disease. This was happening even though workers washed their hands with soap and water before leaving the autopsy area. | **Key Thought**

Washing with soap and water did not remove "cadaverous particles." |
In 1847, Semmelweis began a new policy. Clinic workers would now clean their hands with a chlorine solution between patient contacts.

After this policy was put in place, maternal death rates in the clinic dropped.

This gave the first evidence of the importance of disinfecting hands between patient contacts.

Disinfecting decreased the spread of disease more effectively than handwashing with plain soap and water.
In short, clinicians were looking at the importance of disinfecting hands as early as the middle 1800s.

However, this did not affect early hand hygiene guidelines.

Until 1995, guidelines for hand hygiene in the United States focused on the use of plain soap and water.
In 1995, HICPAC [glossary] first recommended hand antisepsis [glossary]. After contact with a patient infected with a drug-resistant [glossary] pathogen, healthcare workers were advised to decontaminate their hands with either:

- Antimicrobial soap and water
- A waterless antiseptic agent

Examples of Drug-Resistant Pathogens

- Vancomycin-resistant enterococci (VRE)
- Methicillin-resistant Staphylococcus aureus (MRSA)
<table>
<thead>
<tr>
<th><strong>2007</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CDC Guidelines</strong></td>
</tr>
<tr>
<td>Finally, in 2002, the CDC released an extensive <em>Guideline for Hand Hygiene in Health-Care Settings</em>. This guideline recommends alcohol-based hand rubs for routine decontamination of hands in most clinical situations.</td>
</tr>
</tbody>
</table>
Adherence to Guidelines

As we have just seen, guidelines for hand hygiene have changed over the years.

Throughout this time, healthcare workers have had poor compliance with recommended practices.

Some of the reasons for this include:
- Skin irritation and dryness caused by washing hands
- Not enough sinks for washing hands
- Inconvenient location of sinks
- Not enough time to wash hands

Regardless of the reason, poor compliance increases the risk of spreading infection.
The observations of Ignaz Semmelweis suggested that:

a. Washing with soap and water removes all germs from the hands.
b. Germs remain on the hands even after washing with soap and water.
c. More germs remain on the hands after cleaning with a chlorine solution than after washing with soap and water.
d. Both B and C
e. All of the above

**Multiple Choice Interaction**

[CORRECT ANSWER: B]

[RESPONSE FOR A: Incorrect. The correct answer is B.]

[RESPONSE FOR B: Correct.]

[RESPONSE FOR C: Incorrect. The correct answer is B.]

[RESPONSE FOR D: Incorrect. The correct answer is B.]
<table>
<thead>
<tr>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>You have completed the lesson on background and history.</td>
</tr>
<tr>
<td>Remember:</td>
</tr>
<tr>
<td>• In the 1800s, medical professionals first saw evidence of the importance of disinfecting hands. Disinfecting was more effective in preventing the spread of disease than washing with plain soap and water.</td>
</tr>
<tr>
<td>• Over the years, there have been various guidelines for hand hygiene in healthcare.</td>
</tr>
<tr>
<td>• Throughout this time, healthcare workers have had poor compliance with recommended practices. This increases the risk of spreading infection.</td>
</tr>
</tbody>
</table>
### Introduction

Welcome to the lesson on the importance of hand hygiene.

After completing this lesson, you should be able to:
- Recognize patient-care tasks that put caregivers at risk of hand contamination.
- List the steps involved in cross-contamination of patients by healthcare workers.
- Identify the role of hand antisepsis in blocking cross-contamination.

### Lesson map

- Healthcare-associated infection
- Patient-care tasks & risk of infection
- Bacterial flora
- Cross-contamination

**FLASH ANIMATION: 3001.SWF/FLA**
Preventing the Spread of Disease

Remember: Medical professionals first saw the importance of disinfecting hands in the 1800s.

Disinfecting was more effective in preventing the spread of disease than washing with soap and water.

Preventing the spread of disease is just as important today as it was in the 1800s.
According to the CDC, each year in the United States, two million hospitalized patients develop healthcare-associated infections (HAI).

Of these two million patients, up to 90,000 die as a result of the HAI.

Fortunately, proper hand hygiene can help:
- Stop outbreaks of HAI in healthcare facilities.
- Decrease the overall HAI rate.

*Healthcare-associated infection:*

*An infection that develops after a patient has contact with the healthcare system*
Patient Care Tasks & Contamination

Most healthcare workers are aware of the risk of infection during activities such as:
- Contact with patient blood or body fluids
- Care of an infected or draining wound
- Intravascular catheter care
- Respiratory tract care
- Handling of patient secretions
- Changing diapers

But are you aware of the risk of infection with “clean” patient care tasks?
Clean Patient Care Tasks & Contamination

Studies have shown that the hands of a caregiver can become contaminated during routine, non-invasive, “clean” patient care.

For example, contamination can result from:
- Lifting a patient
- Taking a pulse, blood pressure, or oral temperature
- Touching a patient’s hand, shoulder, or groin
- Feeding an infant
- Playing with an infant
- Touching items in a patient’s room

How does this contamination happen?

Let’s answer this question by first considering the human body’s flora.
Bacterial Skin Flora

“Flora” are the bacteria and other microbes that live in and on our bodies.

All people carry millions of bacteria.

This includes you and your patients.

Let’s focus on skin flora.

![Image: 3006.jpg]
Skin flora are often found in high numbers on the hands of healthcare workers.

In most people, skin flora tend to be most concentrated in the:

- **Perineal [link to glossary]** area
- Groin
- Armpits
- Trunk
- Arms
Most of the body’s bacterial flora do not cause disease in healthy people. However, potentially pathogenic bacteria can be present. For example, *Staphylococcus aureus* is common on intact skin.

**S. aureus can cause:**
- Impetigo
- Boils
- Toxic shock syndrome
- Other infections
**Colonization**

*Staph* and other potentially pathogenic bacteria can live on the skin for a long time without causing infection.

This long-term presence without infection is called [colonization](#).

---

**Colonization can lead to infection.**

*This can happen if bacteria on the skin are ever able to enter the body, for example:*

- Through a wound
- By aspiration into the lungs
Both you and your patients are likely to have some bacterial colonization of intact skin.

In addition, all people shed skin with large amounts of viable bacteria, every day.

Thus, bacteria on a patient’s skin are also likely to contaminate the patient’s:

- Gown
- Bed linens
- Bedside furniture
- Other nearby items
Contamination Risk

In short: Bacteria are everywhere, on and around you and your patients.

As a result, there is a high risk that your hands will become contaminated, even during “clean” patient care.

Risk of contamination is everywhere!
Cross-Contamination

When your hands become contaminated from one patient, other patients are at risk for cross-contamination.

Cross-contamination happens as follows
1. Bacteria are present on a patient’s skin or items.
2. A healthcare worker touches the patient’s skin or items. Flora are transferred to the worker’s hand. Note that this transfer is especially likely if the skin is wet.
3. The transferred flora survive on the worker’s hand for several minutes.
4. The worker does not wash or decontaminate his or her hands adequately.
5. The hands of the worker contact another patient. This transfers bacteria to the second patient.
Remember: Bacteria are everywhere!

With this in mind, let’s think about the likelihood of each of the steps in the process of cross-contamination.

Review the table to the right.

As you can see, all steps are likely, except for step 4: inadequate handwashing.

This step depends on the healthcare worker.

**In other words, the best way to block cross-contamination is to always disinfect hands between patient contacts.**
What about Gloves?

In certain cases, gloves should be used during patient care. In these cases, gloves help to prevent:
- Transfer of microbes from caregiver to patient
- Transfer of microbes from patient to caregiver
- Cross-contamination between patients (if gloves are properly removed and replaced between patient contacts)

However, keep in mind that gloves and hand hygiene do not replace one another.

Both should be used, as appropriate.

**Hands should always be washed after removing gloves.**

**Why?**

During patient contact, gloves do not eliminate contamination of caregiver hands. Gloves only reduce contamination.
Review

Choose the true statement(s):
- a. *S. aureus* is common on intact skin.
- b. Bacterial colonization always leads to infection.
- c. Viable bacteria are shed with the skin every day.
- d. Both A and C
- e. All of the above

Multiple Choice Interaction

[CORRECT ANSWER: D]

[RESPONSE FOR A: Not quite. The correct answer is D.]

[RESPONSE FOR B: Incorrect. The best answer is D.]

[RESPONSE FOR C: Not quite. The best answer is D.]

[RESPONSE FOR D: Correct.]

E: Incorrect. The correct answer is D.
Summary

You have completed the lesson on the importance of hand hygiene.

Remember:
- A caregiver’s hands may become contaminated during “clean” patient-care tasks.
- All people have millions of bacteria in and on their bodies at all times.
- Potentially pathogenic bacteria such as *S. aureus* can be common on intact skin.
- Viable bacteria are shed with the skin every day. This contaminates nearby items.
- Cross-contamination happens when a healthcare workers spreads bacteria from one patient to another.
- Proper hand antisepsis between patient contacts is the best way to block cross-contamination.
- Gloves and hand hygiene do not replace one another. Each should be used when appropriate to prevent the spread of disease.
Lesson 4: Handwashing and Hand Antisepsis

**4001**

**Introduction**

Welcome to the lesson on handwashing and hand antisepsis.

After completing this lesson, you should be able to:
- Recognize different hand hygiene products.
- Select situations in which hands should be washed or decontaminated.
- List the steps in the process of washing hands with soap and water.
- List the steps in the process of decontaminating hands with an alcohol rub.
- Identify other important aspects of hand hygiene.

**FLASH ANIMATION: 4001.SWF/FLA**

**Lesson map**

- Hand hygiene products
- When to use each product
  - Soap & water
  - Alcohol rub
- How to use each product
  - Washing with soap and water
  - Decontaminating with an alcohol rub
- Surgical hand hygiene
- Other hand hygiene
### Products

Products used for hand hygiene are:

- **Non-antimicrobial (plain) soap**
- **Antimicrobial soap and non-alcohol antiseptics**
- **Alcohol-based products**

Click on each of the products to learn more.

---

#### CLICK TO REVEAL

**Plain soap**

Plain soaps are detergent-based. They remove dirt, soil, and organic substances from hands. These soaps have little activity against microbes. However, they can help remove loosely clinging skin flora.

**Antimicrobial soaps and non-alcohol antiseptics**

These products contain one or more antimicrobial agents. Each class of antimicrobial agent has a unique spectrum. Depending on its spectrum, an agent may be active against:

- Gram-positive bacteria
- Gram-negative bacteria
- Mycobacteria
- Fungi
- Viruses

Iodine compounds and iodophors are the antimicrobial agents with the broadest spectra. Quaternary ammonium compounds are least effective against most types of microbe.

**Alcohol-based products**

These products include hand rinses, gels, and foams. They contain isopropanol, ethanol, or n-propanol. All of these alcohols are highly effective antimicrobial agents with activity against a broad spectrum of microbes. Alcohol-based products are more effective than plain soap or antimicrobial soap for standard hand hygiene in the healthcare setting. In addition, they address some of the obstacles to hand hygiene that healthcare workers face. Therefore, the CDC currently recommends alcohol rubs for routine hand decontamination.
When to Use Soap and Water

Hands **must** be washed with soap and water:
- When hands are **visibly** dirty or contaminated
- Before eating
- After using a restroom
- If *Bacillus anthracis* [glossary] is suspected or proven

In these situations:
- Soap may be **plain** or **antimicrobial**.
- Antimicrobial wipes may be used as an alternative to handwashing with soap.

---

**Important!**

Alcohols and other antiseptic agents have poor activity against spores (such as *Bacillus anthracis*). When dealing with spores, always wash with antimicrobial soap and water. The scrubbing action helps remove the spores.
When to Use an Alcohol Rub

<table>
<thead>
<tr>
<th>Routine hand decontamination includes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Before direct contact with patients</td>
</tr>
<tr>
<td>• Before putting on sterile gloves to insert a central intravascular catheter</td>
</tr>
<tr>
<td>• Before inserting indwelling urinary catheters, peripheral vascular catheters, or other invasive devices that do not require a surgical procedure</td>
</tr>
<tr>
<td>• After contact with intact patient skin (e.g., after taking a pulse or blood pressure, after assisting in a patient lift or transfer)</td>
</tr>
<tr>
<td>• After contact with bodily fluids or excretions, mucous membranes, non-intact skin, or wound dressings</td>
</tr>
<tr>
<td>• When moving from a contaminated body site to a clean body site on a single patient</td>
</tr>
<tr>
<td>• After contact with items near a patient</td>
</tr>
<tr>
<td>• After removing gloves</td>
</tr>
</tbody>
</table>

Antimicrobial soap and water may be used as an alternative, in any situation calling for an alcohol rub.

**Antimicrobial wipes may NOT be used.**
When using soap and water to wash hands:
1. Wet hands with warm water. Do not use hot water. Hot water can contribute to skin irritation.
2. Apply soap. Use enough soap to give a good lather.
3. Rub hands together vigorously for at least 15 seconds. Cover all surfaces of the hands and fingers. Do this away from the running water so that you do not wash the lather away. Remember to scrub between your fingers and under your nails.
4. Rinse hands with water. Keep arms angled downward in the sink, so that water from your hands goes down the sink, not down your elbows.
5. Dry with a disposable towel.
6. Use the towel to turn off the faucet.
7. Dispose of the towel in an appropriate bin.
How to Use an Alcohol Rub

When using an alcohol rub:
1. Apply the rub to the palm of one hand. Use the volume of product recommended by the manufacturer. You should have enough to wet all surfaces of the hands.
2. Rub hands together until they are dry. Be sure to rub over all surfaces of the hands and fingers.

Do not wash hands after using an alcohol rub. This is not necessary or recommended.
Prior to surgery, a surgical hand scrub with **antimicrobial soap** or an **alcohol rub** is recommended.

These products help slow the growth of bacteria under sterile surgical gloves.

This reduces the risk that bacteria will escape from gloves onto the sterile field.
<table>
<thead>
<tr>
<th>Surgical Hand Hygiene: Jewelry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to the surgical hand scrub, remove all:</td>
</tr>
<tr>
<td>• Rings</td>
</tr>
<tr>
<td>• Watches</td>
</tr>
<tr>
<td>• Bracelets</td>
</tr>
<tr>
<td>Clean underneath the fingernails, using a nail cleaner under running water.</td>
</tr>
</tbody>
</table>

**Jewelry makes a good hiding place for bacteria.**

*Remove all jewelry before scrubbing in for surgery.*
For surgical hand antisepsis using an antimicrobial soap:
- Scrub hands and forearms for the length of time recommended by the product manufacturer (usually two to six minutes).
- Extended scrub times (ten minutes or more) are not necessary.
### Surgical Hand Hygiene: Alcohol Rub

For surgical hand antisepsis using an alcohol product:
- Choose a surgical hand-scrub product with persistent activity [link to glossary].
- Before applying the rub, pre-wash hands and forearms with plain soap and water. Dry completely.
- Apply the alcohol product according to manufacturer instructions.
- Allow hands and forearms to dry completely before putting on sterile surgical gloves.

**A product with persistent activity helps slow re-growth of bacteria after gloving.**
Other Hand-Hygiene Practices: Fingernails

Hand hygiene is not just about washing and decontaminating hands when necessary.

In addition, do not wear artificial fingernails or nail enhancements.

Keep natural nail tips less than ¼-inch long.
Other Hand-Hygiene Practices: Gloves

Use gloves whenever you might have contact with:
- Blood
- Other potentially infectious materials
- Mucous membranes
- Non-intact skin

Always:
- Remove and dispose of gloves between patient contacts.
- Decontaminate hands after removing gloves.

Change gloves during patient care when moving from a contaminated body site to a clean body site.
Your Role in Increasing Hand-Hygiene Compliance

Knowing the guidelines for hand hygiene is not enough. To protect yourself and your patients from infection, you must **practice** proper hand hygiene.

Give your employer input about hand-hygiene products.

Encourage your facility to purchase and provide products that you will use.

*When evaluating hand hygiene products, think about the way they:*

- Feel.
- Smell.
- Affect your skin.
Before inserting an indwelling catheter, wash your hands with plain soap and water.

- **a. True**
- **b. False**

**TRUE/FALSE INTERACTION**

[**CORRECT RESPONSE: B**]

[RESPONSE FOR A: Incorrect. You should use antimicrobial soap and water or an alcohol-based hand rub. Then you should put on sterile gloves to place the catheter.]

[RESPONSE FOR B: Correct. You should use antimicrobial soap and water or an alcohol-based hand rub. Then you should put on sterile gloves to place the catheter.]
<table>
<thead>
<tr>
<th>Choose the true statement(s):</th>
<th>MULTIPLE CHOICE INTERACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Wash hands after removing gloves.</td>
<td>[CORRECT ANSWER: E]</td>
</tr>
<tr>
<td>b. Change gloves between patient contacts.</td>
<td>[RESPONSE TO A: Not quite. The best answer is E. ]</td>
</tr>
<tr>
<td>c. Wear gloves when you might have contact with blood.</td>
<td>[RESPONSE TO B: Not quite. The best answer is E. ]</td>
</tr>
<tr>
<td>d. Both A and B</td>
<td>[RESPONSE TO C: Not quite. The best answer is E. ]</td>
</tr>
<tr>
<td>e. All of the above</td>
<td>[RESPONSE TO D: Not quite. The best answer is E. ]</td>
</tr>
</tbody>
</table>

E: Correct
### Summary

You have completed the lesson on hand hygiene recommendations.

**Remember:**
- Proper hand hygiene between patient contacts is the best way to prevent cross-contamination.
- Alcohol rubs are recommended for routine hand decontamination.
- Soap and water should be used when hands are visibly soiled.
- Decontaminate hands at appropriate times.
- Fingernails should be kept short. Artificial fingernails should not be used.
- Gloves should be used when appropriate. Gloves must be changed between patient contacts.
## Course Glossary

<table>
<thead>
<tr>
<th>#</th>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>antimicrobial</td>
<td>capable of harming or killing microorganisms</td>
</tr>
<tr>
<td>2.</td>
<td>antisepsis</td>
<td>the state of being free of pathogenic organisms</td>
</tr>
<tr>
<td>3.</td>
<td>Bacillus anthracis</td>
<td>the organism that causes anthrax</td>
</tr>
<tr>
<td>4.</td>
<td>contaminate</td>
<td>to make impure or unclean</td>
</tr>
<tr>
<td>5.</td>
<td>cross-contamination</td>
<td>transmission of microorganisms from one person, place, or item to another person, place, or item</td>
</tr>
<tr>
<td>6.</td>
<td>decontaminate</td>
<td>to rid of impurities</td>
</tr>
<tr>
<td>7.</td>
<td>disinfect</td>
<td>to destroy microorganisms or pathogens</td>
</tr>
<tr>
<td>8.</td>
<td>drug-resistant</td>
<td>unable to be harmed by certain drugs</td>
</tr>
<tr>
<td>9.</td>
<td>flora</td>
<td>microbial life found on and in the human body</td>
</tr>
<tr>
<td>10.</td>
<td>HICPAC</td>
<td>Healthcare Infection Control Practices Advisory Committee</td>
</tr>
<tr>
<td>11.</td>
<td>pathogenic</td>
<td>able to cause disease</td>
</tr>
<tr>
<td>12.</td>
<td>perineal</td>
<td>of or relating to the area between the anus and the sex organs</td>
</tr>
<tr>
<td>13.</td>
<td>persistent activity</td>
<td>prolonged or extended antimicrobial activity that prevents or inhibits proliferation or survival of microorganisms after application of a hand-hygiene product</td>
</tr>
<tr>
<td>14.</td>
<td>childbed fever</td>
<td>fever due to infection, occurring within ten days after a woman has a baby, and lasting more than 24 hours</td>
</tr>
<tr>
<td>15.</td>
<td>spectrum</td>
<td>types of microorganisms against which an antimicrobial agent is effective</td>
</tr>
<tr>
<td>16.</td>
<td>spore</td>
<td>small, highly resistant, single-celled reproductive body produced by certain bacteria</td>
</tr>
<tr>
<td>17.</td>
<td>toxic shock syndrome</td>
<td>a potentially serious, sometimes fatal bacterial infection, commonly associated with tampon use</td>
</tr>
<tr>
<td>18.</td>
<td>viable</td>
<td>capable of life or normal growth and development</td>
</tr>
</tbody>
</table>
Hand Hygiene Pre-Assessment Test

1. Choose the true statement(s):
   a. (a) Frequent handwashing with plain soap and water can cause skin irritation.
   b. (b) Historically, guidelines for hand hygiene in healthcare have focused on the use of plain soap and water.
   c. (c) Currently, the CDC recommends plain soap and water for routine decontamination of hands in most clinical situations.
   d. Both A and B
   e. All of the above

Correct answer: D
Rationale: Guidelines for hand hygiene have long recommended the use of plain soap and water. However, current CDC recommendations emphasize the use of alcohol-based rubs.

2. A healthcare worker is at risk for contamination when:
   a. (a) Taking a femoral pulse
   b. (b) Adjusting a patient’s pillow
   c. (c) Caring for an infected wound
   d. Both A and C
   e. All of the above

Correct answer: E
Rationale: Any patient contact carries a risk of contamination. Even “clean” patient care tasks can result in contamination.

3. Choose the true statement(s)
   a. (a) Staph aureus can live harmlessly on the skin.
   b. (b) Whenever bacteria come into contact with the skin, they cause disease.
   c. (c) Only individuals with skin infections (such as impetigo) have bacteria on their skin.
   d. Both B and C
   e. All of the above

Correct answer: A
Rationale: Staph aureus and other potentially pathogenic bacteria can live harmlessly on intact skin.

4. Cross-contamination is most likely when:
   a. A healthcare worker takes a patient’s pulse.
   b. Bacteria colonize the area behind a patient’s elbows and knees.
   c. Skin is punctured and bacteria enter the wound, causing infection.
   d. A healthcare worker does not decontaminate his or her hands between patient contacts.
Correct answer: D
Rationale: Cross-contamination happens when a healthcare workers spreads bacteria from one patient to another. This is most likely to occur when the worker fails to decontaminate his or her hands between patient contacts.

5. Choose the true statement(s).
   a. (a) Iodine compounds are effective against spores.
   b. (b) Alcohol-based compounds have broad antimicrobial spectra.
   c. (c) Plain (non-antimicrobial) soaps are highly effective against Gram-negative bacteria.
   d. Both A and C
   e. All of the above

Correct answer: B
Rationale: Alcohol-based products are active against a broad spectrum of microbes.

6. Your hands become visibly contaminated. You should:
   a. Put on gloves.
   b. Wash with soap and water.
   c. Use an alcohol-based hand rub.
   d. Use an alcohol-based surgical hand rub with persistent activity.

Correct answer: B
Rationale: Whenever hands are visibly soiled, wash with soap and water.

7. You take a patient’s blood pressure. You are not wearing gloves. After this patient contact, you should:
   a. Put on gloves
   b. Use an antimicrobial wipe.
   c. Wash with soap and water.
   d. Use an alcohol-based hand rub.

Correct answer: D
Rationale: Use an alcohol-based rub after contact with intact patient skin.

8. You are preparing to insert a central vascular catheter. You have decontaminated your hands with an alcohol rub. Next you should:
   a. Place the catheter.
   b. Put on sterile gloves.
   c. Wash with plain soap and water.
   d. Wash with antimicrobial soap and water.
Correct answer: B
Rationale: Before inserting an indwelling catheter, decontaminate hands with an alcohol-based rub. Then put on sterile gloves.

9. Choose the best practice(s) when washing hands with soap and water:
   a. (a) Use warm water.
   b. (b) Apply enough soap to make a good lather.
   c. (c) After applying soap, rub hands together for no more than five seconds.
   d. Both A and B
   e. All of the above

Correct answer: D
Rationale: When washing with soap and water, rub hands together for at least 15 seconds.

10. Wash hands with plain soap and water after using an alcohol rub.
   a. True
   b. False

Correct answer: B
Rationale: It is not necessary or recommended to wash hands after using an alcohol rub.
Final Exam

1. Choose the patient-care task(s) that put the healthcare worker at risk of hand contamination.

   Answer 1: (a) Wound care
   Answer 2: (b) Taking a femoral pulse
   Answer 3: (c) Taking an oral temperature
   Answer 4: Both A and C
   Answer 5: All of the above

Correct: All of the above
Rationale: The healthcare worker's hands may become contaminated even during "clean" patient care.

2. Transfer of bacteria from person to person is especially likely if skin is wet.

   Answer 1: True
   Answer 2: False

Correct: True
Rationale: This statement is true.

3. Instead of decontaminating hands between patients, it is okay just to change gloves.

   Answer 1: True
   Answer 2: False

Correct: False
Rationale: Gloves are not a substitute for hand hygiene.

4. Alcohol is highly effective against most microbes. However, hands should be washed with soap and water to remove:

   Answer 1: Mycobacteria
   Answer 2: Bacterial spores
   Answer 3: Gram-positive bacteria
   Answer 4: Gram-negative bacteria

Correct: Bacterial spores
Answer Rationale: Alcohols and other antiseptic agents have poor activity against spores. Therefore, washing with soap and water is recommended. The rubbing action of washing helps remove spores.
5. A healthcare worker transfers bacteria from one patient to another. This is known as:

Answer 1: Contact error
Answer 2: Transmission error
Answer 3: Cross-contamination
Answer 4: None of the above

Correct: Cross-contamination
Rationale: This describes cross-contamination.

6. Washing hands after using an alcohol rub is:

Answer 1: Necessary
Answer 2: Not necessary, but recommended
Answer 3: Neither necessary nor recommended

Correct: Neither necessary nor recommended
Rationale: It is not necessary to wash hands after using an alcohol rub. Nor is washing recommended.

7. Wash hands with plain soap and water:

Answer 1: (a) After using the restroom
Answer 2: (b) After taking a femoral pulse
Answer 3: (c) When hands are visibly dirty
Answer 4: Both A and C
Answer 5: All of the above

Correct Answer: Both A and C
Answer Rationale: Wash hands with plain soap and water when hands are visibly dirty. Also wash with soap and water after using the restroom and before eating. For routine hand decontamination in most clinical situations, use an alcohol rub.

8. Use an alcohol rub:

Answer 1: (a) After removing gloves
Answer 2: (b) Before inserting an indwelling urinary catheter
Answer 3: (c) When moving from a contaminated body site to a clean body site during patient care
Answer 4: Both A and C
Answer 5: All of the above

Correct: All of the above
Rationale: An alcohol rub is recommended in all of these situations.

9. For surgical hand hygiene:

Answer 1: (a) Remove debris from underneath fingernails.
Answer 2: (b) Remove all rings, watches, and bracelets before starting the surgical scrub.
Answer 3: (c) When decontaminating with an alcohol-based hand rub, choose a product with persistent activity.
Answer 4: Both A and B
Answer 5: All of the above

Correct: All of the above
Rationale: These statements are all true of surgical hand hygiene.

10. Bacteria and other microbes are present on normal, intact skin throughout the body.

Answer 1: True
Answer 2: False

Correct: True
Rationale: All people have millions of microbes on intact skin.