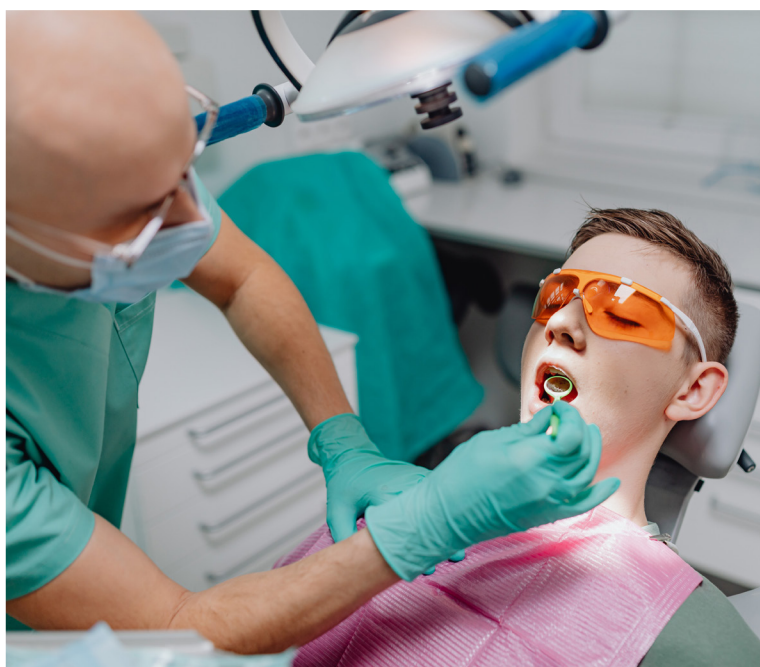




Dental Personal Protective Equipment and Sterilization

Curriculum



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Dental Personal Protective Equipment and Sterilization Curriculum



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About the Author



Angela McBride has been a dental assistant for over 10 years. She took an unusual path to end up in her career because she started with a bachelor's degree in sport management. When she needed a career change, she chose dentistry because she had always been interested in teeth.

Upon completing an associate degree in specialized technology, Angela worked in a dental office, gaining valuable experience in the clinical and administrative side of the industry. She is a certified dental assistant (CDA) and expanded functions dental assistant (EFDA).

Eventually, Angela put her knowledge to use as an instructor at a CODA-approved dental assisting school. Since then, she has completed an M.A. in adult learning and training and has worked with a high school online education platform to create a four-semester dental assisting course. Angela has always been passionate about passing on her knowledge to those interested in a career in dental assisting.

Personal Protective Equipment and Sterilization Curriculum

This curriculum, accompanying slide presentations, and scenario cards will help participants understand personal protective equipment and sterilization.

Curriculum Structure

The *Personal Protective Equipment and Sterilization Curriculum* is composed of the following lessons. Approximate lesson times are included.

Lesson	Title	Approximate Time
One	Standard Precautions and the Prevention of Disease Transmission	70 to 100 minutes
Two	Preventing Cross-Contamination During Procedures	70 to 100 minutes
Three	Dental Instrument Sterilization	70 to 100 minutes
Four	Occupational Safety and Administrative Protocols	70 to 100 minutes
	Total	4.5 to 7 hours

Lesson Structure

Each lesson begins with a Lesson Overview, Lesson Objectives, and a Lesson at a Glance table, listing lesson activities, materials required, suggested preparation steps, and approximate class time.

Lesson Sections

The actual lesson follows the overview, which contains some of the sections described below.

FOCUS

Every lesson begins with a FOCUS activity intended to capture participants' attention. This may be in the form of a small or large class discussion, a game, a demonstration, or a review of previous lesson information. During this activity, participants are introduced to the topic of the lesson.

LEARN

The LEARN activity in each lesson varies in its presentation mode. It may be a slide presentation, group activity, or demonstration.

REVIEW

The majority of lessons end with a REVIEW activity intended to briefly review the lesson's key messages or main points.

Lesson One – Standard Precautions and the Prevention of Disease Transmission

Lesson Overview

In this lesson, participants will learn to recognize infectious diseases and the methods used to prevent transmission to another person.

Lesson Objectives

After completing this lesson, participants will be able to:

- Recognize infectious diseases and their relationship to the patient and occupational risk
- Demonstrate an understanding of how to review medical history to prevent adverse reactions during dental care
- Demonstrate an understanding of proper hand hygiene as performed before, during, and after oral surgery and intraoral procedures
- Describe how to protect the patient and operator by using personal protective equipment
- Demonstrate an understanding of how to protect the patient and operator through reducing aerosol, droplets, and spatter

Lesson at a Glance

Activity	Materials	Preparation	Approximate class time
FOCUS	• <i>Standard Precautions and the Prevention of Disease Transmission</i> worksheet • <i>Standard Precautions and the Prevention of Disease Transmission Instructor Resource</i>	1. Print/photocopy the <i>Standard Precautions and the Prevention of Disease Transmission</i> worksheet (one per participant).	10 minutes
LEARN	• <i>Standard Precautions and the Prevention of Disease Transmission</i> slide presentation • <i>Standard Precautions and the Prevention of Disease Transmission Notes Page</i>	1. Prepare the <i>Standard Precautions and the Prevention of Disease Transmission</i> slide presentation for viewing. 2. Print/photocopy the <i>Standard Precautions and the Prevention of Disease Transmission Notes Page</i> (one per participant).	30 minutes
REVIEW	• Dental Personal Protective Equipment and Sterilization Scenario Cards • <i>Standard Precautions and the Prevention of Disease Transmission Quiz</i> • <i>Standard Precautions and the Prevention of Disease Transmission Quiz – Answer Key</i>	1. Print the <i>Standard Precautions and the Prevention of Disease Transmission Quiz</i> (one per participant).	30-60 minutes

Lesson One – Standard Precautions and the Prevention of Disease Transmission

FOCUS: Developing Awareness for Infection Control in the Dental Operatory

10 minutes

Purpose:

To help participants understand how easily diseases can be transmitted in a dental office.

Materials:

- *Standard Precautions and the Prevention of Disease Transmission* worksheet
- *Standard Precautions and the Prevention of Disease Transmission Instructor Resource*

Facilitation Steps:

1. Distribute the *Standard Precautions and the Prevention of Disease Transmission* worksheet before or at the beginning of class.
2. Have participants read through the information and complete the worksheet.

Name: _____ Class: _____

Standard Precautions and the Prevention of Disease Transmission

Skill: Understanding preventing disease transmission by using personal protective equipment

READ the following:

After preparing the treatment room for a two-surface restoration on your next patient, Martina, you set out personal protective equipment for Dr. Brown and yourself. You place a pair of large latex-free gloves on his side and medium latex-free gloves on the assistant's side.

Your clean safety glasses are already in your pocket, and you know Dr. Brown has his loops with him in the other treatment room. You seat Martina and put on your gloves to apply the topical anesthetic. Dr. Brown enters the room, and after reviewing the procedure with Martina, he begins administering the local anesthetic.

As you retrieve the syringe, the end of your glove gets stuck and rips. While you leave Martina to sit and let the drugs take effect, you change into a new pair of gloves before beginning the remaining portion of the procedure.

REFLECT on the situation:

Even though you already had on a pair of gloves, why was it important to change the gloves before continuing with the procedure?

What could happen if you continued the procedure with the damaged glove?

How would you proceed if the glove became damaged further into the procedure?

How would you explain to the patient your need to change the gloves?

SHARE your thoughts with a peer when it's discussion time.

Standard Precautions and the Prevention of Disease Transmission

Instructor Resource

Skill: Understanding preventing disease transmission by using personal protective equipment

READ the following:

After preparing the treatment room for a two-surface restoration on your next patient, Martina, you set out personal protective equipment for Dr. Brown and yourself. You place a pair of large latex-free gloves on his side and medium latex-free gloves on the assistant's side.

Your clean safety glasses are already in your pocket, and you know Dr. Brown has his loops with him in the other treatment room. You seat Martina and put on your gloves to apply the topical anesthetic. Dr. Brown enters the room, and after reviewing the procedure with Martina, he begins administering the local anesthetic.

As you retrieve the syringe, the end of your glove gets stuck and rips. While you leave Martina to sit and let the drugs take effect, you change into a new pair of gloves before beginning the remaining portion of the procedure.

REFLECT on the situation:

Even though you already had on a pair of gloves, why was it important to change the gloves before continuing with the procedure?

Damaged gloves create an opening for bacteria and other microorganisms to enter and contact your skin. Open wounds on your hand act as a portal, and the pathogens could infect you, causing an infection.

What could happen if you continued the procedure with the damaged glove?

The glove could continue to rip, leaving your entire hand vulnerable to blood and saliva, which can carry harmful pathogens.

How would you proceed if the glove became damaged further into the procedure?

Signal to the dentist and notify him that the procedure needs to pause while you change into a new pair of gloves.

How would you explain to the patient your need to pause the procedure?

Explain that the gloves became damaged, and gloves with a hole do not provide an adequate layer of protection. Therefore, the procedure needed to pause so you could change your gloves.

Lesson One – Standard Precautions and the Prevention of Disease Transmission

LEARN: Infectious Diseases and How to Prevent Them

30 minutes

Purpose:

Participants will receive a thorough introduction to infectious diseases and what steps they can take to prevent them.

Materials:

- *Standard Precautions and the Prevention of Disease Transmission* slide presentation
- *Standard Precautions and the Prevention of Disease Transmission* Notes Page

Facilitation Steps:

Share the following information as you show the slide presentation. Give participants the *Standard Precautions and the Prevention of Disease Transmission Notes Page* so they may write down information that is important for them to remember.

Slide 1: Introduction slide

Slide 2: Goals and Objectives

There are no pre-requisites for this lesson.

Slide 3: Chain of Infection

Pathogens are disease-causing microorganisms. Without them, we would not have a transmissible, infectious disease. Examples of pathogens include:

- Viruses
- Bacteria
- Fungi
- Parasites

A reservoir is the environment where a pathogen lives, duplicates, and thrives. Pathogens may live in humans, animals, or the environment.

The portal of exit is any route that the pathogen can escape the reservoir. In humans, a portal of exit can be bodily fluids, including droplets associated with coughing, sneezing, talking, and open wounds.

Mode of transmission is how the disease spreads from person to person. The most common form of transmission is direct contact between two people. In dentistry, direct contact includes skin-to-skin contact and touching oral or body lesions.

Another mode is through droplet transmission, which includes coughing, sneezing, or talking. This is done by inhaling droplets, touching particles on the surface and transferring them to the face, and droplets entering the mucous membranes of the face.

Other modes of transmission include bloodborne pathogens and airborne pathogens.

The portal of entry is where the pathogen enters the body. Some examples are inhalation, absorption, and ingestion.

Having a susceptible host is the last link in the chain of infection. This is where the pathogen lives and creates the adverse effects you see as disease symptoms.

To break the chain of infection, you must eliminate the pathogen at the transmission source and protect any portal of entry.

Slide 4: Immunity

Our immune systems protect us from infectious diseases, which is an infection that spreads from person to person or through contact with body fluids.

When we have immunity, our body can resist diseases and stops pathogens from causing an infection. Immunity can be inherited, meaning it is present at birth or acquired naturally or artificially throughout life.

Slide 5: Infectious Diseases of Concern in Dentistry

A microorganism is a living thing that cannot be seen with the human eye. When they have a susceptible host, they cause infectious diseases that can often spread easily through direct or indirect contact.

Groups of microorganisms include:

- Bacteria
- Algae
- Protozoa
- Fungi
- Viruses
- Prions

Bacteria are large groups of one-celled microorganisms in varying sizes, shapes, and arrangements of cells. Although there are good bacteria in our respiratory and gastrointestinal tract and skin, others cause bacterial infections that spread in many ways.

Some bacteria change into spores, a highly resistant form of this microorganism. One example of a disease caused by spores is tetanus. Spores are the most resistant pathogen, surviving in extreme heat and dry environments as well as resisting disinfectants and radiation. Harmless spores are used to ensure sterilization techniques are effective against them.

Protozoa are one-celled organisms found in freshwater and moist soil. They have thick walls that make them live longer. While most protozoa do not cause diseases, some live in a host and cause an infection. Protozoa may cause human intestinal infections or infect the blood, lungs, liver, or brain.

Fungi are organisms like mold without chlorophyll, mushrooms, and yeast. One of the most common fungi in dentistry is *Candida*, yeast in the mouth. You can also find this fungus in the gastrointestinal tract, female genital tract, and skin.

It is caused by the yeast *Candida albicans* and typically affects young, old, and ill patients. Many patients with dentures develop a yeast infection under their dentures. Patients with human immunodeficiency virus (HIV) are also commonly affected.

Viruses are smaller than bacteria but cause many serious diseases. They must have a viable host to live and multiply within, with the host being a human, animal, plant, or bacteria. After invading a host, the virus copies itself and destroys host cells, releasing more viruses into the body.

Viruses are transmitted in the following ways:

- Direct contact
- Insects
- Needle sticks
- Blood transfusions
- Contaminated food or water
- Coughing or sneezing

Viruses are easily destroyed using bleach, iodine, phenol, and formaldehyde.

Some examples of viral diseases include:

- All forms of viral hepatitis
- human immunodeficiency virus (HIV)
- Herpes viruses

Slide 6: Reviewing a Medical History

Every patient must complete a medical-dental health history for their patient record. It must be reviewed by the dental team, and they should ask appropriate questions to understand the patient's well-being. These forms must be completed by a legal guardian if the patient is a minor. Keeping an accurate medical history helps prevent adverse reactions during dental care.

To obtain a medical history, explain the document's importance to the patient, including the importance of honest, accurate answers.

Personal Protective Equipment and Sterilization Curriculum

Offer the patient assistance or answer any questions if they get stuck.

After they've completed the form, review it for any potential errors, missing information, or allergies. You may need further explanation on some of their answers.

Use this information to prepare the treatment room. For example, if the patient has a latex allergy, ensure that the room has no latex products. The most common is gloves, but other products, such as prophylactic cups, may contain latex.

Slide 7: Hand Hygiene

A crucial step in preventing cross-contamination is washing your hands before putting on gloves and immediately after removing them. Gloves may contain small holes or get torn throughout the procedure, contaminating your hands.

Furthermore, bacteria multiply quickly in the moisture created by your gloves. Handwashing is required if you accidentally touch a contaminated item barehanded. It's best to use liquid soap because bar soap may transmit diseases.

Slide 8: Surgical Handwashing

Surgical procedures require more careful handwashing because of the increased risk of infection. Performing a surgical scrub reduces the chances of infection. Sterile gloves are used but can still have minor defects and tear during the procedure. Therefore, a dental professional's hands must be thoroughly cleaned using a surgical scrub.

Slide 9: Personal Protective Equipment

Dental assistants must wear personal protective equipment (PPE) when working directly with patients. These items must be provided at no charge to all employees and include:

- Protective clothing
- Surgical masks
- Face shields
- Safety glasses
- Treatment gloves
- Utility gloves

This safety gear must be worn when you potentially could contact blood and saliva that produces splash, spatter, and aerosol particles.

Protective masks must cover the nose and mouth to protect against inhaling infectious particles.

Safety goggles or a face shield must be worn to protect the eyes from aerosol, spatter particles, and flying tooth debris.

Patients should be offered protective eyewear, too. It's possible for handpiece spatter, splashed dental materials, and airborne particles to damage their eyes.

Depending on the task performed, different gloves are used throughout the dental office. Examination and sterile surgical gloves must meet the U.S. Food and Drug Administration (FDA) standards. Although utility gloves are used during infection control procedures, they do not follow FDA regulations since they are not designed for medical use.

Slide 10: Rubber Dam

A rubber dam provides a layer of protection for the patient and the dental team. It protects patients from the dental unit water and reduces the amount of aerosol and spatter of patient microorganisms.

A rubber dam is made from latex or silicone. The material comes in varying colors, sizes, and thicknesses, and the type used depends on the procedure.

Standard Precautions and the Prevention of Disease Transmission

Notes Page

Directions: Take notes in the space provided as information is shared in the slide presentation and lecture on this topic.

Question	Notes
What are microorganisms?	
What are the links in the chain of infection?	
What is the difference between inherited and acquired immunity?	
List the parts of the rubber dam.	

Standard Precautions and the Prevention of Disease Transmission

Notes Page – Answer Key

Directions: Take notes in the space provided as information is shared in the slide presentation and lecture on this topic.

Question	Notes
What are microorganisms?	Pathogens, such as viruses and bacteria
What are the links in the chain of infection?	Infectious agent, reservoir, portal of exit, mode of transmission, portal of entry, and susceptible host
What is the difference between inherited and acquired immunity?	Inherited immunity is transmitted from a mother to her baby. Acquired immunity comes from building antibodies via exposure or vaccines.
List the parts of the rubber dam.	Dental dam material, frame, forceps, and clamps

Lesson One – Standard Precautions and the Prevention of Disease Transmission

REVIEW: Standard Precautions and the Prevention of Disease Transmission

30-60 minutes

Purpose:

Participants will apply the knowledge learned in the lecture. They will problem-solve a series of special needs by role-play using simulated infection control scenarios.

Materials:

- Dental Personal Protective Equipment and Sterilization Scenario Cards
- *Standard Precautions and the Prevention of Disease Transmission Quiz*
- *Standard Precautions and the Prevention of Disease Transmission Quiz – Answer Key*

6. When participants are finished with the scenarios, instruct them to complete the quiz.
7. Have participants self-check their answers as you share from the answer key.

Facilitation Steps:

1. Using their notes, have participants review the standard precautions and prevention of disease transmission.
2. Have participants get in five groups and give each group a set of Dental Personal Protective Equipment and Sterilization Scenario Cards.
3. Assign the scenarios about standard precautions and the prevention of disease transmission.
4. Have each small group read through the scenario. They should choose one person from the group to be the dental assistant and one to be the patient.
5. Each group should act out the scenario for the entire class. After each role-play, a group discussion can be facilitated to answer the questions for that scenario.

Standard Precautions and the Prevention of Disease Transmission Quiz

Select the best answer to the following multiple-choice questions:

1. Which of these is not a part of the chain of infection?
 - a. Portal of entry
 - b. Portal of exit
 - c. Sterilization
 - d. Susceptible host
2. Acquired immunity occurs when:
 - a. You build antibodies from exposure to a pathogen
 - b. You inherit antibodies from your mother
 - c. You receive a vaccination
 - d. A and C
3. The first step in a standard handwashing procedure is to:
 - a. Turn on the water
 - b. Remove all jewelry
 - c. Put soap on your hands
 - d. None of the above
4. During a surgical hand scrubbing, you must wash your hands for a total of _____ minutes.
 - a. 3
 - b. 7
 - c. 14
 - d. 21
5. Examination and sterile surgical gloves are medical devices regulated by the following:
 - a. FDA
 - b. EPA
 - c. ADA
 - d. BPA

Standard Precautions and the Prevention of Disease Transmission

– Answer Key

Select the best answer to the following multiple-choice questions:

1. Which of these is not a part of the chain of infection?
 - a. Portal of entry
 - b. Portal of exit
 - c. Sterilization**
 - d. Susceptible host
2. Acquired immunity occurs when:
 - a. You build antibodies from exposure to a pathogen
 - b. You inherit antibodies from your mother
 - c. You receive a vaccination
 - d. A and C**
3. The first step in a standard handwashing procedure is to:
 - a. Turn on the water
 - b. Remove all jewelry**
 - c. Put soap on your hands
 - d. None of the above
4. During a surgical hand scrubbing, you must wash your hands with soap for a total of _____ minutes.
 - a. 3
 - b. 7
 - c. 14**
 - d. 21
5. Examination and sterile surgical gloves are medical devices regulated by the following:
 - a. FDA**
 - b. EPA
 - c. ADA
 - d. BPA

Sources

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2. Risk of bacterial transmission in dental practice. (n.d.). Retrieved September 25, 2022, from <https://cda-adc.ca/jcda/vol-66/issue-10/550.html>
3. *Welcome*. Nurse Aide Infection Control. (n.d.). Retrieved September 24, 2022, from https://apps.hhs.texas.gov/providers/NF/credentialing/cna/infection-control/module2/Module_2_Chain_of_Infection_print.html

Lesson Two – Preventing Cross-Contamination During Procedures

Lesson Overview

In this lesson, participants will learn the basics of maintaining aseptic conditions throughout dental procedures.

Lesson Objectives

After completing this lesson, participants will be able to:

- Demonstrate an understanding of how to maintain aseptic conditions to prevent cross-contamination for procedures and services
- Explain the need for surface barriers
- Identify single-use and reusable items
- Discuss pre-cleaning and disinfection

Lesson at a Glance

Activity	Materials	Preparation	Approximate class time
FOCUS	• <i>Preventing Cross-Contamination During Procedures</i> worksheet • <i>Preventing Cross-Contamination During Procedures Instructor Resource</i>	1. Print/photocopy the <i>Preventing Cross-Contamination During Procedures</i> worksheet (one per participant).	10 minutes
LEARN	• <i>Preventing Cross-Contamination During Procedures</i> slide presentation • <i>Preventing Cross-Contamination During Procedures Notes Page</i>	1. Print/photocopy the <i>Preventing Cross-Contamination During Procedures Note Page</i> (one per participant). 2. Prepare the <i>Preventing Cross-Contamination During Procedures</i> slide presentation for viewing.	30 minutes
REVIEW	• Dental Personal Protective Equipment and Sterilization Scenario Cards • <i>Preventing Cross-Contamination During Procedures Quiz</i> • <i>Preventing Cross-Contamination During Procedures Quiz – Answer Key</i>	1. Print the <i>Preventing Cross Contamination During Procedures Quiz</i> (one per participant).	30 to 60 minutes

Lesson Two – Preventing Cross-Contamination During Procedures

FOCUS: Focus on Aseptic Techniques

10 minutes

Purpose:

Participants will complete a worksheet about preventing cross-contamination between dental procedures.

Materials:

- *Preventing Cross-Contamination During Procedures* worksheet
- *Preventing Cross-Contamination During Procedures Instructor Resource*

Facilitation Steps:

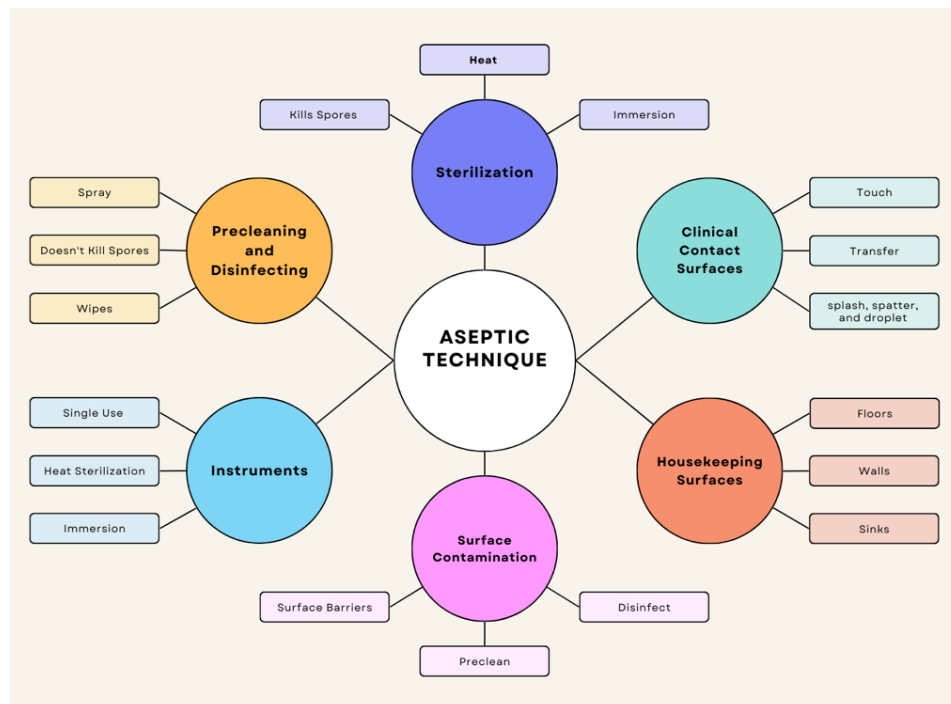
1. Distribute the *Preventing Cross-Contamination During Procedures* worksheet before or at the beginning of class.
2. Have participants read through the information and complete the worksheet.
3. Share the answers as a class.

Name: _____ Class: _____

Preventing Cross-Contamination During Procedures

Skill: Protecting patients and dental team members from cross-contamination of infectious diseases

REVIEW the following mind map:



REFLECT on the following:

What do you think it means by clinical contact surfaces?

What are the three aseptic techniques used to prevent cross-contamination with patient instruments?

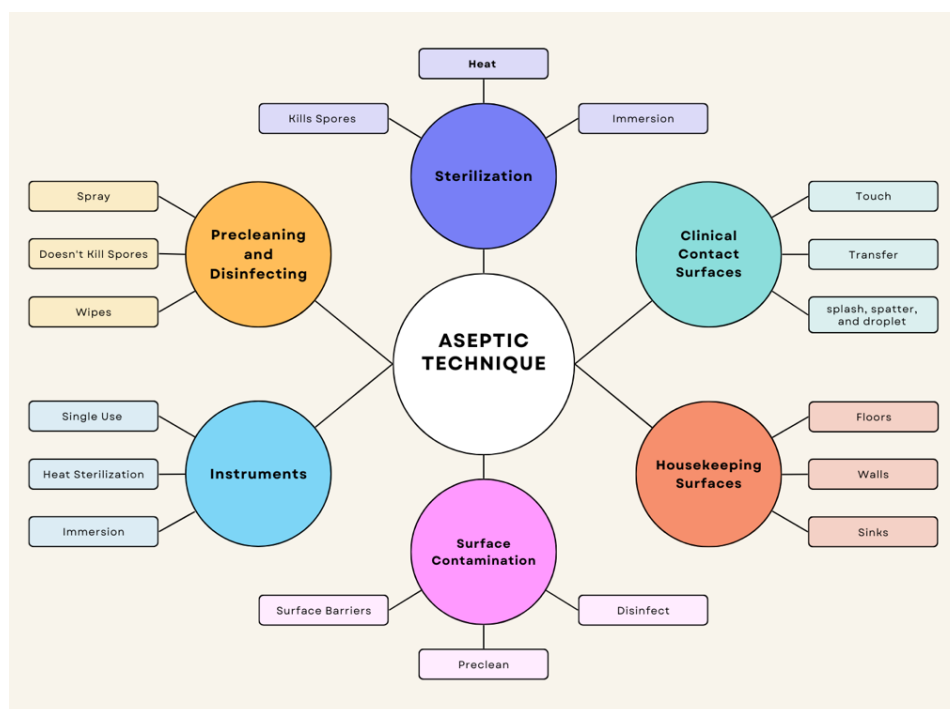
What is one problem you see with pre-cleaning and disinfection methods?

What do you think is the difference between clinical contact surfaces and housekeeping surfaces?

Preventing Cross-Contamination During Procedures Instructor Resource

Skill: Protecting patients and dental team members from cross-contamination of infectious diseases

REVIEW the following mind map:



REFLECT on the following:

What do you think it means by clinical contact surfaces?

Any area that easily gets contaminated by particles during dental treatments

What are the three aseptic techniques used to prevent cross-contamination with patient instruments?

Single-use items get disposed of after use, heat sterilization, and immersion disinfection

What is one problem you see with pre-cleaning and disinfection methods?

It doesn't kill spores

What do you think is different between clinical contact surfaces and housekeeping surfaces?

Clinical contact surfaces may need more frequent cleaning than housekeeping surfaces

Lesson Two – Preventing Cross-Contamination During Dental Procedures

LEARN: How to Prevent Cross-Contamination

30 minutes

Purpose:

Participants will receive a thorough introduction to methods used to prevent cross-contamination during dental procedures.

Materials:

- *Preventing Cross-Contamination During Procedures* slide presentation
- *Preventing Cross-Contamination During Procedures* Notes Page

Facilitation Steps:

Share the following information as you show the slide presentation. Give participants the *Preventing Cross-Contamination Between Procedures* Notes Page so they may write down information that is important for them to remember.

Slide 1: Introduction slide

Slide 2: Goals and Objectives

No pre-requisite is required for this lesson.

Slide 3: Environmental Infection Control

According to the CDC Guidelines for Infection Control in Dental Healthcare Settings—2003, a dental operatory can be divided into two categories:

- Clinical contact surfaces
- Housekeeping surfaces

Housekeeping surfaces include:

- Sink
- Floors
- Walls

These surfaces have a lower risk of transmitting infectious disease, so cleaning isn't as demanding as it is for clinical contact surfaces and patient instruments.

When you're preparing to clean and disinfect a dental operatory, you must consider the following:

- Extent of direct patient contact
- How much hand contact
- How much aerosol or spray contamination
- Other sources of contaminants, like water

Slide 4: Clinical Contact Surfaces

Clinical contact surfaces are contaminated because they get exposed to spray or spatter created during the dental procedure or by a dirty, gloved hand. Clinical contact surfaces are classified in three ways:

- Touch
- Transfer
- Splash, spatter, and droplet

Touch and transfer surfaces require barrier protection or must be cleaned and disinfected between patients. Splash, spatter, and droplet surfaces must be cleaned at least once daily.

Touch surfaces become contaminated when someone touches them directly. Touch surfaces include:

- Chair switches
- Dental unit controls
- Light handles
- Computers or tablets
- Pens

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- Telephones
- Dental material containers
- Drawer handles

Transfer surfaces are not directly touched but have contact with contaminated instruments. These surfaces include instrument trays and handpiece holders.

Splash, spatter, and droplet surfaces never directly contact people or contaminated instruments, such as a countertop.

Slide 5: Housekeeping Surfaces

Housekeeping surfaces have less risk of transmitting diseases, so most surfaces can be cleaned with a detergent or an EPA-registered, low-level disinfectant.

However, if cleaning solutions aren't made fresh daily, they may carry harmful microorganisms between surfaces.

Slide 6: Surface Contamination

Surfaces quickly become contaminated in dentistry, but two methods are used to prevent this from happening: using surface barriers or pre-cleaning and disinfecting between patients. Most dental offices use both methods for the most effective protection.

Surface barriers cover equipment and surfaces to prevent cross-contamination of any clinical contact area. Barriers are crucial to protect areas that are difficult to clean.

All surface barriers should be fluid resistant to prevent microorganisms in bodily fluids from penetrating the barrier and touching the surface underneath.

Some plastic barriers are designed to fit the air-water syringe, curing lights, and dental chairs. Other barriers are:

- Clear plastic wraps
- Bags
- Tubes
- Plastic tape
- Plastic-backed paper
- Sticky tape

Aluminum foil may also be used because it can be shaped to fit around any device.

Contaminated barriers are changed and immediately disposed of while the dental assistant is still gloved. When removing dirty barriers, the surfaces below must not be touched, or you will have to clean and disinfect the surface.

Even though barriers protect surfaces, they must be cleaned and disinfected daily at the beginning and end of the workday.

Slide 7: Single-Use Items

Single-use items are often used in dentistry because they are disposable and create the least risk of transmitting disease. They are called single-use items because they are only used on one patient. These items are made of plastic or other inexpensive materials. Disposable items do not need to be cleaned or disinfected.

Examples of single-use items include:

- Prophylaxis cups and brushes
- Sterilization pouches
- Irrigating syringes
- Patient napkins
- Surface barriers
- Face masks
- Gloves
- Syringe or suture needles
- Sharps containers

Slide 8: Pre-Cleaning

When a surface is pre-cleaned, it means all debris is removed from the surface. Even if there isn't any visible blood, a thin layer of saliva could still be present and contain microorganisms, making the disinfectant less effective.

Pre-cleaning is most effective on smooth surfaces because irregular textures create places for pathogens to hide, interfering with disinfection.

Regular soap and warm water can be used for pre-cleaning.

There are risks of exposure to chemicals used during the pre-cleaning process, so be sure to use appropriate PPE throughout, including gloves, safety glasses, and a mask.

Slide 9: Disinfecting

Disinfecting kills disease-causing pathogens remaining on the surface after pre-cleaning is completed. However, spores are not killed during disinfection. Only sterilization destroys all forms of life.

The Environmental Protection Agency (EPA) registers and regulates all chemicals used for disinfecting and sterilizing. Only EPA-registered chemicals claiming to kill tuberculosis should be used in dentistry. These products are labeled tuberculocidal. Sporicidal products can kill spores. Virucidal destroys viruses, and fungicidal products kill fungi.

Many chemicals are available to use as surface disinfectants. You must read the labels carefully to ensure it qualifies for what you need. Other information you'll find on a disinfectant label includes:

- Shelf life
- Reuse life
- Directions for use
- Warnings for handling the products
- Storage
- Disposal

Slide 10: Chemical Classifications of Disinfectants

Slide 11: Ideal Surface Disinfectant

An ideal surface disinfectant quickly kills many bacteria. It has residual activity, meaning it continues to work for a period of time after it's been applied. Other characteristics of an ideal surface disinfectant include:

- No odor
- Cost-effective
- Work on surfaces containing blood or saliva
- Easy to use

Currently, no disinfectant fits this description. When choosing a chemical, weigh the pros and cons of each product. Some dental equipment manufacturers recommend a specific product for their dental chairs or units.

Slide 12: Evacuation System

The evacuation system comprises two parts: high-volume evacuators and traps.

High-volume evacuation (HVE) prevents saliva and spatter from exiting the patient's mouth, reducing contamination of surfaces and the dental team. This system must be cleaned regularly, including the tubing, piping, and pumps. The HVE is different from the saliva ejector in that it removes large particles.

The HVE must be cleaned at the end of the day using a detergent to flush the system. Bleach should not be used because it can lead to corrosion throughout the system.

Traps in the evacuation system prevent large debris from traveling deeper into the system. This debris includes dried blood, impression material, and pieces of teeth. The traps must be removed periodically for cleaning, and the best method is to use a disposable trap.

When working with the traps, wear gloves, masks, protective eyewear, and protective clothing to avoid contact with particles.

Preventing Cross-Contamination During Procedures Notes Page

Directions: Take notes in the space provided as information is shared in the slide presentation and lecture on this topic.

Question	Notes
What are the two classifications of surfaces in dentistry?	
Why must clinical contact surfaces be cleaned so rigorously?	
List some examples of single-use items.	
Which level of disinfectant is considered a hospital-grade disinfectant?	

Preventing Cross-Contamination During Procedures Notes Page – Answer Key

Directions: Take notes in the space provided as information is shared in the slide presentation and lecture on this topic.

Question	Notes
What are the two classifications of surfaces in dentistry?	Housekeeping and clinical contact
Why must clinical contact surfaces be cleaned so rigorously?	They are exposed to spray or spatter during dental procedures or dirty, gloved hands
List some examples of single-use items.	Prophy cups and brushes, sterilization pouches, irrigating syringes, patient napkins, surface barriers, face masks, gloves, syringe or suture needles, and sharp containers
Which level of disinfectant is considered a hospital-grade disinfectant?	Intermediate

Lesson Two – Preventing Cross-Contamination During Dental Procedures

REVIEW: Preventing Cross-Contamination During Procedures

30-60 minutes

Purpose:

Participants will apply the knowledge learned in the lecture. They will problem-solve a series of scenarios by role-play.

Materials:

- Dental Personal Protective Equipment and Sterilization Scenario Cards
- *Preventing Cross-Contamination During Dental Procedures Quiz*
- *Preventing Cross-Contamination During Dental Procedures – Answer Key*

Facilitation Steps:

1. Using their notes, have participants review how to prevent cross-contamination.
2. Have participants get in five group and give each group a set of Dental Personal Protective Equipment and Sterilization Scenario Cards.
3. Assign the scenarios about preventing cross-contamination during procedures.
4. Have each small group read through the scenario. They should choose one person from the group to be the dental assistant and one to be the patient.
5. Each group should act out the scenario for the entire class. After each role-play, a group discussion can be facilitated to answer the questions regarding that scenario.
6. When participants are finished with the scenario role-plays, instruct them to take a few minutes to complete the quiz.
7. Have participants self-check their answers as you share from the answer key.

Name: _____ Class: _____

Preventing Cross-Contamination During Procedures Quiz

Select the best answer to the following multiple-choice questions:

1. Housekeeping surfaces include which of the following?
 - a. The dental chair
 - b. Countertops and walls
 - c. Sinks, walls, and floors
 - d. All the above
2. A _____ surface requires surface barriers or pre-cleaning and disinfecting between patients.
 - a. Touch
 - b. Transfer
 - c. Splash, spatter, and droplet
 - d. A and B only
3. Pre-cleaning must be done before disinfection because _____.
 - a. Pre-cleaning works best on smooth surfaces
 - b. You don't have to wear PPE for pre-cleaning, but you do for disinfectant
 - c. Disinfectant is less effective in the presence of debris
 - d. There is a risk when exposed to disinfecting chemicals
4. Disinfecting agents kill _____.
 - a. All forms of microorganisms
 - b. All forms of microorganisms except spores
 - c. All forms of microorganisms except viruses
 - d. All forms of microorganisms except bacteria
5. The high-volume evacuator _____.
 - a. Stops saliva and spatter from exiting the patient's mouth
 - b. Stops blood from spreading on a countertop
 - c. Stops chemicals from being too strong
 - d. None of the above

Preventing Cross-Contamination During Procedures Quiz – Answer Key

Select the best answer to the following multiple-choice questions:

1. Housekeeping surfaces include which of the following?
 - a. The dental chair
 - b. Countertops and walls
 - c. Sinks, walls, and floors**
 - d. All the above
2. A _____ surface requires surface barriers or pre-cleaning and disinfecting between patients.
 - a. Touch
 - b. Transfer
 - c. Splash, spatter, and droplet
 - d. A and B only**
3. Pre-cleaning must be done before disinfection because _____.
 - a. Pre-cleaning works best on smooth surfaces
 - b. You don't have to wear PPE for pre-cleaning, but you do for disinfectant
 - c. Disinfectant is less effective in the presence of debris**
 - d. There is a risk when exposed to disinfecting chemicals
4. Disinfecting agents kill _____.
 - a. All forms of microorganisms
 - b. All forms of microorganisms except spores**
 - c. All forms of microorganisms except viruses
 - d. All forms of microorganisms except bacteria
5. The high-volume evacuator _____.
 - a. Stops saliva and spatter from exiting the patient's mouth**
 - b. Stops blood from spreading on a countertop
 - c. Stops chemicals from being too strong
 - d. None of the above

Sources

1. Bird, D., & Robinson, D. (2021). Principles and Techniques of Disinfection. In *Modern Dental Assisting* (pp. 286–296). essay, Elsevier.

Lesson Three – Dental Instrument Sterilization

Lesson Overview

In this lesson, participants will learn to the standard operating procedures for sterilizing dental instruments.

Lesson Objectives

After completing this lesson, participants will be able to:

- Explain how to process reusable dental instruments and devices
- List the seven steps involved in processing dental instruments
- Describe the most common methods of heat sterilization as well as the advantages and disadvantages of each
- Demonstrate an understanding of how to monitor and maintain processing equipment and sterilizers

Lesson at a Glance

Activity	Materials	Preparation	Approximate class time
FOCUS	• <i>Dental Instrument Sterilization</i> worksheet • <i>Dental Instrument Sterilization Instructor Resource</i>	1. Print/photocopy the <i>Dental Instrument Sterilization</i> worksheet (one per participant).	10 minutes
LEARN	• <i>Dental Instrument Sterilization</i> slide presentation • <i>Dental Instrument Sterilization Notes Page</i>	1. Prepare the <i>Dental Instrument Sterilization</i> slide presentation for viewing. 2. Print/photocopy the <i>Dental Instrument Sterilization Notes Page</i> (one per participant).	30 minutes
REVIEW	• Dental Personal Protective Equipment and Sterilization Scenario Cards • <i>Dental Instrument Sterilization Quiz</i> • <i>Dental Instrument Sterilization Quiz – Answer Key</i>	1. Print the <i>Dental Instrument Sterilization Quiz</i> (one per participant).	30-60 minutes

Instructor Note: Focus activities may also be completed before class.

Lesson Three – Dental Instrument Sterilization

FOCUS: CDC Guidelines for Infection Control

10 minutes

Purpose:

To help participants develop an understanding of dental instrument sterilization.

Materials:

- *Dental Instrument Sterilization* worksheet
- *Dental Instrument Instructor Resource*

Facilitation Steps:

1. Distribute the *Dental Instrument Sterilization* worksheet before or at the beginning of class.
2. Have participants read through the information and complete the worksheet.

Name: _____ Date: _____

Dental Instrument Sterilization

Skill: Understanding the terminology used in instrument sterilization

READ the following:

After completing your most recent procedure, it is time for you to process the dental instruments. You transport the instruments to the processing area and **pre-clean** them to prepare them for **sterilization**. Some of these instruments are made from plastic, so you know they cannot withstand heat sterilization, but you need to use something more substantial than **an intermediate-level disinfectant**.

Plastic instruments are placed in the liquid sterilant, a **high-level disinfectant**. The instruments must remain in contact with the sterilant for 10 hours, or it will not kill all microorganisms. Critical instruments, which have contacted blood, must be heat sterilized. After pre-cleaning, you package the instruments according to the procedures, ensuring they all are marked with process indicators.

You place them in the autoclave, set the timer, and let the machine do its job. The machine automatically shuts off after 30 minutes, and the instruments cool down before you remove them. Once they are cool and dry, you check the process indicators to see if they've changed color, indicating the machine reached the appropriate temperature.

Directions: Using the **bold** words in the paragraph and context clues, match the instrument sterilization term with the definition below.

- _____ Process that destroys all forms of life, including spores
- _____ Chemical that kills some, but not all, microorganisms unless it remains in contact for a specified amount of time
- _____ Method used to reduce the microorganisms on instruments by physically removing debris
- _____ Chemical that is effective on *M. tuberculosis* and destroys microorganisms, except spores

SHARE your thoughts with a peer when it's discussion time.

Dental Instrument Sterilization

Skill: Understanding the terminology used in instrument sterilization

READ the following:

After completing your most recent procedure, it is time for you to process the dental instruments. You transport the instruments to the processing area and **pre-clean** them to prepare them for **sterilization**. Some of these instruments are made from plastic, so you know they cannot withstand heat sterilization, but you need to use something more substantial than **an intermediate-level disinfectant**.

Plastic instruments are placed in the liquid sterilant, a **high-level disinfectant**. The instruments must remain in contact with the sterilant for 10 hours, or it will not kill all microorganisms. Critical instruments, which have contacted blood, must be heat sterilized. After pre-cleaning, you package the instruments according to the procedures, ensuring they all are marked with process indicators.

You place them in the autoclave, set the timer, and let the machine do its job. The machine automatically shuts off after 30 minutes, and the instruments cool down before you remove them. Once they are cool and dry, you check the process indicators to see if they've changed color, indicating the machine reached the appropriate temperature.

Directions: Using the **bold** words in the paragraph and context clues, match the instrument sterilization term with the definition below.

Sterilization

Process that destroys all forms of life, including spores

High-level disinfectant

Chemical that kills some, but not all, microorganisms unless it remains in contact for a specified amount of time

Low-level disinfectant

Method used to reduce the microorganisms on instruments by physically removing debris

Pre-cleaning

Chemical that is effective on *M. tuberculosis* and destroys microorganisms, except spores

SHARE your thoughts with a peer when it's discussion time.

Lesson Three – Dental Instrument Sterilization

LEARN: How To Sterilize Dental Instruments

30 minutes

Purpose:

Participants will receive a thorough introduction to dental instrument sterilization procedures.

Materials:

- *Dental Instrument Sterilization* slide presentation
- *Dental Instrument Sterilization Notes Page*

Facilitation Steps:

Share the following information as you show the slide presentation. Give participants the *Dental Instrument Sterilization Notes Page* so they may write down information that is important for them to remember.

Slide 1: Introduction slide

Slide 2: Goals and Objectives

Pre-requisite information for this lesson is the Preventing Cross-Contamination During Procedures lesson.

Slide 3: Instrument Processing

A primary responsibility of a dental assistant is to ensure dental instruments and other patient care go through instrument processing. This is a seven-step process to ensure all instruments are prepared to use with the next patient.

1. Transport: Moving contaminated instruments to the processing area using a leakproof container to minimize the risk of exposing someone. All PPE must be worn.
2. Cleaning: Using a hands-free method to remove debris from the instrument.
3. Packaging: Wrapping/packaging instruments and ensuring process indicators are on the outside.
4. Sterilization: Loading and running the sterilization equipment according to the

manufacturer's directions. Packages must be labeled and not overload the machine. Run the machine appropriately and allow the instruments to cool before removing them from the device.

5. Storage: Place instruments in a clean, dry area for storage, rotating packages so the ones with the oldest sterilization date get used first.
6. Delivery: Take the packages to the operatory, maintaining sterility until use. Ensure no packages are damaged and open using aseptic techniques.
7. Quality: Use a quality assurance program that includes training, recordkeeping, maintenance, and biologic indicators.

Slide 4: Patient Care Items

Patient care items are placed into three categories: critical, semi-critical, and non-critical. They are defined by their risk for infection, which determines the minimum sterilization requirements.

Any instrument that penetrates soft tissue or bone is classified as a critical instrument. These create the highest risk of transmitting infection and must be heat sterilized. Examples of critical instruments are forceps, scalpels, and burs.

Instruments that contact mucous membranes or non-intact skin are semi-critical. They have a lower risk of transmitting diseases but should still be heat sterilized. However, if the item cannot withstand heat, it must undergo immersion sterilization with a high-level disinfectant. Semi-critical instruments include a rubber dam, forceps, X-ray film holders, and burnishers.

Non-critical instruments only contact intact skin and create the least risk for transmitting diseases. Devices like the lead apron and curing light should be cleaned with an EPA-registered, intermediate- or low-level disinfectant after each patient use.

Slide 5: Instrument Processing Area

The sterilization area (instrument processing area) should be located near the center of the office, so all team members have adequate access; this prevents team members from carrying contaminated items through the office.

An instrument processing area should be used only for processing instruments; no other business should be conducted there. It should be physically separate from the treatment rooms and in-office laboratory. This area should not be part of a walkway and not have doors or windows with outside access. This prevents dust from entering the room.

Every processing area should have adequate air circulation to help control the heat produced by the sterilizing equipment. All items needed to complete instrument processing should be available in the area.

Each sterilization area should have a hands-free sink for rinsing instruments. There should be no carpeting, and the floor should be seamless.

Slide 6: Workflow Pattern

All instrument processing areas will be different sizes and shapes, but the same four rules apply to the workflow pattern. Instruments should always be processed in a single loop from dirty to storage without doubling back.

Another workflow pattern is the U-shaped pattern. It follows the same pattern from entrance to exit but has a slightly different shape.

After use, dirty instruments are put in the contaminated area, which is the first spot in the workflow pattern.

Instruments should be thoroughly cleaned, removing all debris, blood, and saliva.

The packaging area is for cleaned instruments that are ready to be packaged for sterilization. This area should have adequate counter and

storage space for sterilized instruments, fresh disposable supplies, and prepared trays.

Clean instruments are not sterile and may contain pathogens.

Slide 7: Pre-Cleaning Instruments

Using holding solutions is the first step to pre-cleaning instruments. If an instrument cannot be immediately cleaned, it must be placed in a holding solution to prevent blood from drying. This solution may be any liquid that won't cause corrosion. Commercial enzymatic solutions or dishwasher detergent are often used.

Instrument pre-cleaning happens using one of three methods: hand scrubbing, ultrasonic cleaning, or instrument washing machines.

- **Hand scrubbing:** This method is not recommended because of the contact it requires with contaminated patient care items. If you must hand scrub, wear PPE and clean one or two instruments at a time with a long-handled brush.
- **Ultrasonic cleaner:** These machines are used to loosen and remove blood and debris from contaminated instruments. It also eliminates the need for hand scrubbing. Wear appropriate PPE when handling instruments inside the ultrasonic cleaner and removing them after the cycle is complete. Instruments should run through the ultrasonic cleaner until they are visibly clean. This could take between 5 and 15 minutes, depending on the amount and type of debris.
- **Automated instrument washers:** These devices look and operate like a household dishwasher. They use a combination of recirculating hot water and soap to remove organic debris. They also automatically dry the instruments. They are not FDA approved for medical use.

Slide 8: Rust Inhibitors

Many instruments and burs are made of materials that rust when exposed to steam sterilization methods. Rust inhibitors are used to help prevent rust and corrosion.

Personal Protective Equipment and Sterilization Curriculum

An alternative method to prevent corrosion is to dry the instruments completely with dry heat or unsaturated chemical vapor sterilization.

Slide 9: Packaging Instruments

Before sterilization, contaminated instruments must be wrapped or packaged to protect them from recontamination after completing sterilization. If they are sterilized without packaging, they are considered contaminated after being removed from the sterilizer.

Packaging allows you to organize them by groups, like composite, prophylaxis, or crown instruments.

Packaging materials must be FDA approved, so you must only use packages labeled as sterilization packaging. Do not use plastic wrap, freezer bags, or paper as an alternative, as they may melt or prevent the sterilizing agent from contacting the instruments inside.

Many materials are available for use.:

- Self-sealing bags
- Paper wraps
- Cloth wraps

If the package is not self-sealing, it must be covered with sterilization indicator tape to seal it. Never use pens, pins, staples, or paper clips that could poke holes in the packaging.

Slide 10: Methods of Sterilization

Sterilization means all life forms, including bacterial spores, are destroyed. Any reusable item that has direct contact with the patient's blood, saliva, or mucous membranes must be heat-sterilized.

The most common methods of heat sterilization in the dental office are:

- Steam sterilization
- Chemical vapor sterilization
- Dry heat sterilization

Most reusable items can be heat sterilized, but some plastic items, like shade guides, may be ruined by heat. These items must be placed in a liquid sterilant.

Slide 11: Steam Autoclave

Autoclaves are dental sterilizers that work with heat under pressure. This is done by heating water to create steam that produces moist heat, killing microorganisms.

Autoclaves have four cycles:

- Heat-up cycle
- Sterilizing cycle
- Depressurization cycle
- Drying cycle

Steam fills the sterilizer, pushing out cool air through the escape valve. It closes, increasing the pressure. The heat is responsible for killing the microorganisms, not the pressure. The temperature for using an autoclave is maintained for a set time, usually between 3 and 30 minutes.

To keep instruments sterile, allowing them to dry before taking them out of the steam sterilizer is crucial. Damp packages are easily ripped, leaving them vulnerable to contamination.

Slide 12: Flash Sterilization

Flash sterilization refers to sterilizing instruments without packaging. This method uses short exposure times, but it is not preferred. Unwrapped instruments are not considered sterile after they have been removed from the machine.

This method should only be used when instruments will be used immediately after removing them from the sterilizer.

Slide 13: Unsaturated Chemical Vapor

Unsaturated chemical vapor sterilization is like autoclaving, but it uses a combination of chemicals instead of water to create the vapor. Any office that uses this method must have a Safety Data Sheet (SDS) to comply with OSHA standards.

This method does not rust or corrode dry metal instruments or destroy endodontic files. Many items can withstand this form of sterilization. It has a short cycle time, and instruments come out dry.

The disadvantage to this method is that it requires ventilation because of the formaldehyde and methyl alcohol released when the door is open. These chemicals may cause an odor to drift through the office and irritate the eyes.

For this form of sterilization to be effective, it must satisfy three criteria:

- Pressure of 20 psi
- Temperature of 270° F
- Time, which should measure 20-40 minutes

Slide 14: Dry Heat Sterilization

Dry heat sterilization works by heating air and transferring the heat from the air to the patient care items. These machines must reach 320-375° F and run for different lengths of time.

The advantage of this method is that instruments will not rust if they aren't dried thoroughly before being placed in the sterilizer.

Static air sterilizers work like an oven. Coils at the bottom are heated, forcing hot air to rise. Heat is transferred from the static air to the instruments within one to two hours.

Disadvantages of this method include:

- Time
- Vulnerable to calculation errors

Instruments must be packaged in a heat-resistant material. Aluminum foil, metal, and glass containers may be used.

A forced air sterilizer circulates the hot air around the machine at high speeds. This permits heat to move from the air to the instrument, reducing the time needed for sterilization. The time for instruments processing through forced air ranges from 6 minutes for unwrapped instruments to 12 minutes for packaged instruments.

Slide 15: Liquid Sterilant

Some items cannot withstand heat sterilization. Items like rubber dam frames and shade guides require liquid sterilization methods, like 2-3.4% glutaraldehyde. This must have a 10-hour contact time to ensure sterilization. Anything shorter is only disinfection.

Slide 16: Sterilization Monitoring

Three forms of sterilization monitoring are used to ensure instruments are properly sterilized.

- Physical
- Chemical
- Biologic

These unique processes have different functions, but each method must be used to guarantee sterility.

Physical monitoring requires the assistant to look at gauges and record the exposure time, temperature, and pressure the sterilizer reaches. These readings do not guarantee sterilization, but an inaccurate reading indicates a problem with the equipment.

Chemical monitoring occurs externally and internally using a heat-sensitive, color-changing chemical. These change colors under certain conditions. The two chemical monitoring types are process indicators and process integrators.

Indicators are on the external package, like autoclave tape or markings on the packages. Integrators go inside the package with the instruments in strips or tabs. They respond to pressure, temperature, and time.

These items don't guarantee sterility.

Biologic monitoring is the only way to know that sterilization took place. This method uses strips of paper containing harmless spores placed inside the sterilizer. It's placed inside the machine with instruments and runs through a sterilization cycle. After the cycle ends, the strips are tested. If the spores remain alive, the sterilization fails, and the machine needs repairing.

Personal Protective Equipment and Sterilization Curriculum

The CDC and ADA recommend at least weekly biologic monitoring to ensure equipment works correctly, but all states may have different requirements.

Slide 17: Handpiece Sterilization

High-speed dental handpieces move up to 400,000 revolutions per minute. Blood and other debris may get lodged in the head of the handpiece, potentially contaminating another patient. Handpieces must be cleaned and sterilized by following the manufacturer's directions.

Name: _____ Date: _____

Dental Instrument Sterilization Notes

Page

Directions: Take notes in the space provided as information is shared in the slide presentation and lecture on this topic.

Question	Notes
Dental instruments are placed into three categories for sterilization. Name them.	
What are the three methods for pre-cleaning instruments?	
Which form of sterilization requires ventilation because of the toxic chemicals used?	

Personal Protective Equipment and Sterilization Curriculum

How long is the contact time for a liquid sterilant to guarantee sterilization?	
What are the three types of sterilization monitoring?	
Why is spore testing necessary?	

Name: _____ Date: _____

Dental Instrument Sterilization Notes

Page – Answer Key

Directions: Take notes in the space provided as information is shared in the slide presentation and lecture on this topic.

Question	Notes
Dental instruments are placed into three categories for sterilization. Name them.	Critical, semi-critical, and non-critical
What are the three methods for pre-cleaning instruments?	Hand scrubbing, ultrasonic cleaner, and automated instrument washer
Which form of sterilization requires ventilation because of the toxic chemicals used?	Unsaturated chemical vapor
How long is the contact time for a liquid sterilant to guarantee sterilization?	10 hours

Personal Protective Equipment and Sterilization Curriculum

What are the three types of sterilization monitoring?	Physical, chemical, and biologic
Why is spore testing necessary?	If spores are alive, then the sterilization failed, and the machine needs to be repaired.

Lesson Three – Dental Instrument Sterilization

REVIEW: Identification and Assessment of Sterilizing Instruments

30-60 minutes

Purpose:

Participants will apply the knowledge learned in the lecture. They will problem-solve a series of scenarios by role-play using simulated PPE practices and sterilization techniques.

Materials:

- Dental Personal Protective Equipment and Sterilization Scenario Cards
- *Dental Instrument Sterilization Quiz*
- *Dental Instrument Sterilization Quiz – Answer Key*

Facilitation Steps:

1. Using their notes, have participants review dental instrument sterilization.
2. Have participants get in five groups and give each group a set of Dental Personal Protective Equipment and Sterilization Scenario Cards.
3. Assign the scenarios about dental instrument processing.
4. Have each small group read through the scenario. They should choose one person from the group to be the dental assistant and one to be the patient.

Explain to the groups that they will role-play the scenario for the whole class.
5. Each group should act out the scenario for the entire class. After each role-play, a group discussion can be facilitated to answer the questions regarding that scenario.
6. When participants are finished with the scenario role-plays, instruct them to take a few minutes to complete the quiz.
7. Have participants self-check their answers as you share from the answer key

Name: _____ Date _____

Dental Instrument Sterilization Quiz

Select the best answer to the following multiple-choice questions:

1. How many steps are there in instrument processing?
 - a. 3
 - b. 5
 - c. 7
 - d. 9
2. A dental bur is classified as a _____ instrument.
 - a. Critical
 - b. Semi-critical
 - c. Non-critical
 - d. A and B
3. Hand scrubbing is a method used for:
 - a. Sterilizing
 - b. Pre-cleaning
 - c. Packaging
 - d. Drying
4. Which method of sterilization uses heat under pressure?
 - a. Steam sterilization
 - b. Chemical vapor sterilization
 - c. Dry heat sterilization
 - d. None of the above
5. What is another name for spore testing?
 - a. Physical monitoring
 - b. Chemical monitoring
 - c. Biologic monitoring
 - d. None of the above

Dental Instrument Sterilization – Answer Key

1. How many steps are there in instrument processing?
 - a. 3
 - b. 5
 - c. 7**
 - d. 9
2. A dental bur is classified as a _____ instrument.
 - a. Critical**
 - b. Semi-critical
 - c. Non-critical
 - d. A and B
3. Hand scrubbing is a method used for:
 - a. Sterilizing
 - b. Pre-cleaning**
 - c. Packaging
 - d. Drying
4. Which method of sterilization uses heat under pressure?
 - a. Steam sterilization**
 - b. Chemical vapor sterilization
 - c. Dry heat sterilization
 - d. None of the above
5. What is another name for spore testing?
 - a. Physical monitoring
 - b. Chemical monitoring
 - c. Biologic monitoring**
 - d. None of the above

Sources

1. Bird, D., & Robinson, D. (2021). Principles and Techniques of Instrument Processing and Sterilization. In *Modern Dental Assisting* (pp. 301–318). essay, Elsevier.

Lesson Four – Occupational Safety and Administrative Protocols

Lesson Overview

In this lesson, participants will learn the standards set by the Occupational Safety and Health Administration.

Lesson Objectives

After completing this lesson, participants will be able to:

- Demonstrate an understanding of occupational safety standards and guidelines for personnel
- Demonstrate knowledge of how to maintain and document programs/policies for infection control and safety

Lesson at a Glance

Activity	Materials	Preparation	Approximate class time
FOCUS	• <i>Occupational Safety and Administrative Procedures</i> worksheet • <i>Occupational Safety and Administrative Procedures Instructor Resource</i>	1. Print/photocopy the <i>Occupational Safety and Administrative Procedures</i> worksheet (one per participant).	10 minutes
LEARN	• <i>Occupational Safety and Administrative Procedures</i> slide presentation • <i>Occupational Safety and Administrative Procedures Notes Page</i>	1. Prepare the <i>Occupational Safety and Administrative Procedures</i> slide presentation for viewing. 2. Print/photocopy the <i>Occupational Safety and Administrative Procedures Notes Page</i> (one per participant).	30 minutes
REVIEW	• Dental Personal Protective Equipment and Sterilization Scenario Cards • <i>Occupational Safety and Administrative Procedures Quiz</i> • <i>Occupational Safety and Administrative Procedures Quiz – Answer Key</i>	1. Print the <i>Occupational Safety and Administrative Procedures</i> (one per participant).	30-60 minutes

Lesson Four – Occupational Safety and Administrative Procedures

FOCUS: Focus on Regulating Agencies

10 minutes

Purpose:

To help participants understand how easily diseases can be transmitted in a dental office.

Materials:

- *Occupational Safety and Administrative Procedures* worksheet
- *Occupational Safety and Administrative Procedures Instructor Resource*

Facilitation Steps:

1. Distribute the *Occupational Safety and Administrative Procedures* worksheet before or at the beginning of class.
2. Have the *Occupational Safety and Administrative Procedures Instructor Resource* available.
3. Have participants read through the information and complete the worksheet.

Name: _____ Class: _____

Occupational Safety and Administrative Procedures

Skill: Understanding the regulating bodies that govern infection control and safety in dentistry

READ the following:

The dentist is primarily responsible for compliance with regulating agencies in the dental office. However, the dental assistant is responsible for maintaining compliance daily, along with the required recordkeeping. You notice a new assistant disposing of anesthetic needles in the regular trash can instead of placing them in a sharps container.

Another incident occurs in which you see her handling contaminated instruments without wearing gloves. You've also noticed that infection control logs have not been updated in the past week. Maintaining the safety of every dental team member and patient must be a team effort, and you're becoming frustrated with the lack of action by your teammate.

REFLECT on the situation:

Why is it crucial for all dental professionals to follow the rules and regulations set by OSHA and other regulating agencies?

What first course of action should you take to correct the issue?

Where can you go for resources and information about infection control and the related regulations?

SHARE your thoughts with a peer when it's discussion time.

Occupational Safety and Administrative Procedures

Skill: Understanding the regulating bodies that govern infection control and safety in dentistry

READ the following:

The dentist is primarily responsible for compliance with regulating agencies in the dental office. However, the dental assistant is responsible for maintaining compliance daily, along with the required recordkeeping. You notice a new assistant disposing of anesthetic needles in the regular trash can instead of placing them in a sharps container.

Another incident occurs in which you see her handling contaminated instruments without wearing gloves. You've also noticed that infection control logs have not been updated in the past week. Maintaining the safety of every dental team member and patient must be a team effort, and you're becoming frustrated with the lack of action by your teammate.

REFLECT on the situation:

Why is it crucial for all dental professionals to follow the rules and regulations set by OSHA and other regulating agencies?

Rules and regulations are established to protect patients and dental team members. Any deviation from these regulations puts everyone in the dental office and community at risk.

What first action should you take to correct the issue with the new dental assistant?

Remind her of the infection control protocols in place for your office. If she continues to ignore the standards, bring it to the dentist's attention, who may need to schedule training.

Where can you go for resources and information about infection control and the related regulations?

Visit the websites of the Occupational Safety and Health Administration, Centers for Disease Control and Prevention, Environmental Protection Agency, Food and Drug Administration, American Dental Association, and state and local organizations.

SHARE your thoughts with a peer when it's discussion time.

Lesson Four – Occupational Safety and Administrative Procedures

LEARN: Infectious Diseases and How To Prevent Them

30 minutes

Purpose:

Participants will receive a thorough introduction to the governing bodies and infection control recordkeeping.

Materials:

- *Occupational Safety and Administrative Procedures* slide presentation
- *Occupational Safety and Administrative Procedures Notes Page*

Facilitation Steps:

Share the following information as you show the slide presentation. Give participants the *Occupational Safety and Administrative Procedures Notes Page* so they may write down information that is important for them to remember.

Slide 1: Introduction slide

Slide 2: Goals and Objectives

There are no pre-requisites for this course.

Slide 3: Centers for Disease Control and Prevention

Many government agencies contribute to dentistry's infection control standards.

The Centers for Disease Control and Prevention (CDC) is the primary federal agency that works to protect the health and safety of people in the United States and those living abroad. They use scientific data to form public health recommendations, including infection control procedures in dentistry.

They published their Guidelines for Infection Control in Dental Healthcare Settings—2003.5, serving as the dentistry standard. The CDC cannot make laws, but other state, local, and federal agencies use their recommendations as the basis of their laws.

The CDC is a valuable source of health information for the public and employees of the dental industry.

Slide 4: Food and Drug Administration

The U.S. Food and Drug Administration (FDA) regulates how medical devices are manufactured and labeled. The following items are regulated by the FDA:

- Masks
- Gloves
- Protective eyewear
- Mouth rinses
- Sterilants
- Ultrasonic cleaners
- Disinfecting solutions
- Dental handpieces
- Biologic and chemical indicators
- Instruments
- Dental chairs
- Dental unit lights
- Antimicrobial handwashing products

The FDA also reviews all product labels to ensure that any claims are true.

Slide 5: Environmental Protection Agency

In dentistry, the Environmental Protection Agency (EPA) regulates the safety and effectiveness of disinfectants. All information

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must be submitted and approved by the EPA before a manufacturer can market their product. The EPA reviews any antimicrobial claims to verify that they are backed by scientific evidence. If it is granted approval by the EPA, it is issued a registration number that must appear on the product label.

The EPA also regulates chemical and medical waste after they are sent from the dental office to the disposal site.

Slide 6: Occupational Safety and Health Administration

The Occupational Safety and Health Administration (OSHA) is responsible for ensuring American workers are safe and their health is not jeopardized. They do this by establishing and enforcing standards employers must follow to ensure a safe workplace for all employees.

OSHA also provides training and education to encourage constant improvements in workplace safety and health. OSHA's two most important contributions to dentistry are the Bloodborne Pathogens Standard and the Hazard Communication Standard.

OSHA ensures businesses maintain compliance with its standards by thoroughly investigating their workplace. If it fails to meet the minimum requirements for safety, it may be given a citation for every violation. The citation is typically a fine, but if the issue remains uncorrected, OSHA has the legal authority to shut the business down until the problem is resolved. OSHA provides guidelines for hazard information, recordkeeping guidelines, and copies of standards at no cost.

Slide 7: Hazardous Chemicals

Hazardous chemicals may cause a physical or health hazard. It is considered hazardous if:

- It can catch fire
- Explode when mixed with other substances
- Corrosive
- Toxic

The three primary chemical exposures are inhalation, ingestion, and skin contact. Once the chemical enters the body, it depends on the dose and duration of the exposure. But it can cause acute or chronic chemical toxicity.

- Acute chemical toxicity occurs when there is a high level of exposure over a short time. This type of exposure often happens because of chemical spills. A person may feel dizzy, faint, nauseous, or vomit after acute overexposure.
- Chronic chemical toxicity occurs because of several repeated exposures over a long time. Victims may have liver disease, brain disorders, cancer, or infertility.

Always review the Safety Data Sheet (SDS) and read the product labels before using a product.

Always wear chemical-resistant gloves, a mask, and protective eyewear when handling hazardous chemicals.

Accidental spills of hazardous chemicals will happen, but an office that has planned and practiced will be prepared. Always refer to the SDS sheet for the spilled product to learn how to manage a spill.

Mercury spill kits should be available in any dental office where amalgam is used. It should contain a mercury-absorbing powder, sponges, and a disposal bag. Wear a mask and utility gloves when a mercury spill is being cleaned.

Empty containers need proper handling too. They may contain flammable, explosive residue. Never fill an empty container with another chemical because a dangerous reaction could occur. Follow the SDS instructions for the proper disposal of empty containers.

Slide 8: Eyewash Units

OSHA requires every workplace with hazardous chemicals to have an eyewash station. Some eyewash units attach directly to existing faucets for use during emergencies while still allowing everyday faucet use. When operating, the unit flushes the eyes with a wide water flow to

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remove all contaminants without additional damage.

Wall-mounted eyewash stations provide an alternative to the sink-mounted option. OSHA requires all eyewash stations to undergo monthly inspections to verify that they are working. Accurate records must be kept of the inspection.

All employees must be trained on how to use the eyewash station. Always follow the manufacturer's instructions for the maintenance of the eyewash station.

Slide 9: Hazardous Waste Disposal

Materials are considered hazardous if they have specific properties of chemicals that could be harmful to your health and environment after being discarded. Individual states regulate the disposal of hazardous waste, and sometimes, within the same state, regulations vary between counties and cities.

Check the regulations for your area to ensure you are following protocol for disposing of these chemicals. A general rule to follow is that if it has the following characteristics, it is hazardous:

- Flammable
- Highly acidic or extremely basic
- Chemically unstable or gives off toxic fumes
- Contains arsenic, mercury, lead, silver, barium, or certain pesticides
- Listed as hazardous by the EPA

The EPA has a list of several hundred chemicals classified as hazardous.

Slide 10: Hazardous Communication Standard

OSHA created the Hazard Communication Standard in 1983. It's also called the Employee Right-to-Know Law. Under this law, employers must inform their employees about known hazardous chemicals to which they may have been exposed.

There have been three significant changes to this standard since its inception. They are hazard classification, labels, and safety data sheets.

Specific hazard criteria have been formulated to place chemicals into categories that compare the severity of hazards. Once a chemical is

classified and assigned a warning for that category. All substances in the same category have the same warnings.

Labels have been standardized to have a signal word, pictogram, and hazard statement to match a hazard class and category.

Safety Data Sheets (SDS) will all have a 16-section format.

All employers had until June 1, 2016, to adapt to these changes and complete training for their employees.

Slide 11: Written Program

Part of the Hazardous Communication Standard requires a written program. It must list the names of all employees who handle hazardous chemicals. One individual must be named as the person responsible for the program, often a dental assistant.

The written program must do the following:

- Describe staff training
- Describe how the office handles chemicals, including labeling and safety protocols
- Detail how to respond to a chemical emergency, like a spill or exposure

If multiple dentists work at a single office, all employers must know how to train their employees about hazardous chemicals and protective steps.

Slide 12: Employee Training

Employee training is a crucial part of the hazardous communication program. Staff training must be arranged when a new employee is hired, a new chemical is introduced, and once a year to maintain compliance. A chemical training must include the following information:

- Safe use of hazardous chemicals
- Understanding the SDS
- Safety methods, including warnings
- Required PPE
- Safe handling and disposal

Records of this training must be kept for at least five years.

Slide 13: Chemical Labels

Every chemical container in a dental office must have a label indicating what chemical is inside and any associated hazards. Labels must include all required information, and all employees must be trained to understand and read them.

A chemical must also have a label if it is transferred into a different container. For example, when using a concentrated chemical disinfected mixed with water in a spray bottle, it is prepared in a secondary bottle. This requires a label to identify the chemical and hazards it presents.

Slide 14: Dental Office Waste Management

Any waste created in a dental office is regulated by federal, state, or local policies. Many chemicals affect the environment, but the effects are minimized when handled right. Regulations differ between states, with some requiring dental offices to have specific wastes removed by a licensed carrier. A dental assistant must understand these regulations and be familiar with the types of dental waste to ensure they are placed accordingly.

Slide 15: Bloodborne Pathogens Standard

OSHA's Bloodborne Pathogen Standard (BBP) is a crucial infection control law in dentistry. Its purpose is to protect employees from contracted a bloodborne disease, such as hepatitis.

The BBP mandates employers to provide protection against blood and other bodily fluids in the office and to provide access to proper care if an exposure occurs. This rule applies to any workplace where employees may be exposed to bodily fluids, like the dental office. OSHA requires every dental office to keep a copy of the BBP Standard.

They also should have a written exposure control plan, which details how the office maintains compliance with the BBP Standard. This plan must be updated at least once a year.

Employers must categorize tasks and procedures in which an employee might contact blood or other bodily fluids.

- Category I: These employees are regularly exposed to blood and saliva. This includes the dentist, hygienist, and assistants.
- Category II: These employees may occasionally be exposed to blood, saliva, or both. Some front office assistants may occasionally clean rooms or help with instrument processing.
- Category III: These employees are never exposed to blood, saliva, or fluid, such as an insurance processor or financial manager.

According to the BBP, occupational exposures are any stick through the skin with a needle or human bite, contact with mucous membranes, and exposure to bodily fluids. This creates a risk of transmission of infectious diseases.

Although you may make every effort to prevent accidental exposure, accidents happen. But when you're prepared with a BBP Standard written plan, you'll be prepared. This plan details the steps the employee should take after the exposure, including medical follow at no charge to the employee.

Employers are responsible for training their employees to respond to an exposure incident. This training must include infection control procedures and safety. Records must be kept for all sessions and must consist of the following information:

- Date of training
- Name of presenter
- Topic presented
- Names of employees present

A crucial part of the BBP standard is the Hepatitis B (HBV) immunization mandate. All employers must offer the vaccination to the Category I or II employee within 10 days. Documentation is required and the dentist must have proof from the physician who administered the vaccine. However, the employee can refuse

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to get the HBV vaccination. They must sign an informed refusal, which the dentist keeps in the employee file. However, the employee can change their mind and get the immunization later.

Slide 16: Employee Records

The employer must keep employee medical records confidential. These records must be stored in a locked file throughout their employment, plus an additional 30 years.

Occupational Safety and Administrative Procedures Notes Page

Directions: Take notes in the space provided as information is shared in the slide presentation and lecture on this topic.

Question	Notes
What is the CDC and what role do they play in dentistry?	
What does FDA stand for and what do they regulate?	
What is the Hazard Communication Standard and who established it?	
What is the Written Program portion of the Hazard Communication Standard?	

Occupational Safety and Administrative Procedures Notes Page – Answer Key

Directions: Take notes in the space provided as information is shared in the slide presentation and lecture on this topic.

Question	Notes
What is the CDC and what role do they play in dentistry?	The CDC is the Center for Disease Control and Prevention. They published the Guidelines for Infection Control in Dental Healthcare Settings.
What does FDA stand for and what do they regulate?	FDS stands for Food and Drug Administration. They regulate medical devices.
What is the Hazard Communication Standard and who established it?	It's a law that requires employers to inform employees about the hazardous chemicals they work with. It was created by OSHA.
What is the Written Program portion of the Hazard Communication Standard?	The Written Program lists the names of employees who encounter hazardous materials.

Lesson Four – Occupational Safety and Administrative Procedures

REVIEW: Occupational Safety and Administration

30-60 minutes

Purpose:

Participants will apply the knowledge learned in the lecture. They will problem-solve a series of scenarios by role-play using simulated infection control scenarios.

Materials:

- Dental Personal Protective Equipment and Sterilization Scenario Cards
- *Occupational Safety and Administrative Procedures Quiz*
- *Occupational Safety and Administrative Procedures Quiz – Answer Key*

Facilitation Steps:

1. Using their notes, have participants review occupational safety and administrative procedures.
2. Have participants get in five groups and give each group a set of Dental Personal Protective Equipment and Sterilization Scenario Cards.
3. Assign the scenarios about occupational safety and administrative protocols.
4. Have each small group read through the scenario. They should choose one person from the group to be the dental assistant and the patient.
5. Each group should act out the scenario for the entire class. After each role-play, a group discussion can be facilitated to answer the questions regarding that scenario.
6. When participants are finished with the scenario role-plays, instruct them to take a few minutes to complete the quiz.
7. Have participants self-check their answers as you share from the answer key.

Occupational Safety and Administrative Procedures Quiz

Select the best answer to the following multiple-choice questions:

1. The _____ is the primary federal agency that works to protect the health and safety of people in the United States and those living abroad
 - a. ADA
 - b. CDC
 - c. EPA
 - d. FDA
2. The _____ issues registration numbers that must appear on all approved products.
 - a. ADA
 - b. CDC
 - c. EPA
 - d. FDA
3. OSHA is responsible for:
 - a. Using scientific data to form public health recommendations, including infection control procedures in dentistry
 - b. Regulating how medical devices are manufactured and labeled
 - c. Ensuring American workers are safe, and their health is not jeopardized on the job
 - d. The safety and effectiveness of disinfectant
4. The Hazard Communication Standard was created in what year?
 - a. 1983
 - b. 1992
 - c. 2003
 - d. 2012
5. Dental office waste is regulated by which of the following?
 - e. Federal policy
 - f. State policy
 - g. Local policy
 - h. All the above

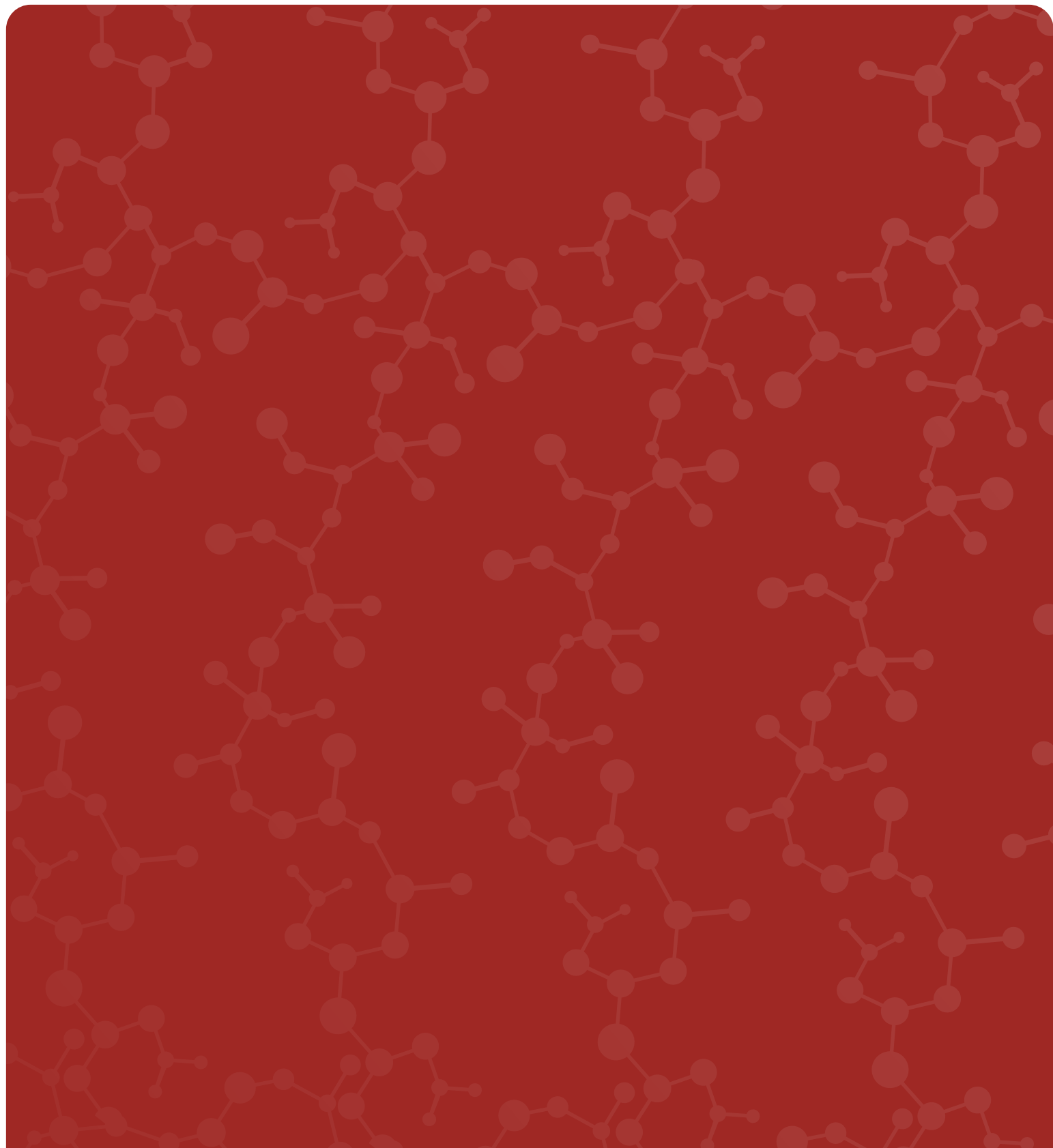
Occupational Safety and Administrative Procedures Quiz – Answer Key

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Sources

1. Bird, D., & Robinson, D. (2021) Regulatory and Advisory Agencies. In *Modern Dental Assisting* (pp. 326–331). essay, Elsevier.
2. Bird, D., & Robinson, D. (2021) Chemical and Waste Management. In *Modern Dental Assisting* (pp. 332–343). essay, Elsevier.



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