OSHAcademy™
Occupational Safety & Health Training

Dental Office Safety

This course is designed to help provide a solid foundation for employees working in dental offices. It will look at the potential health risks of working in a dental setting and ways you, as an employee, can protect yourself and other co-workers from potential health problems. The course will also discuss ways to properly clean and sanitize common machinery in a dental laboratory.

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OSHAcademy Course 608 Study Guide

Dental Office Safety

This study guide is designed to be reviewed off-line as a tool for preparation to successfully complete OSHAcademy Course 608.

Read each module, answer the quiz questions, and submit the quiz questions online through the course webpage. You can print the post-quiz response screen which will contain the correct answers to the questions.

The final exam will consist of questions developed from the course content and module quizzes.

We hope you enjoy the course and if you have any questions, feel free to email or call:

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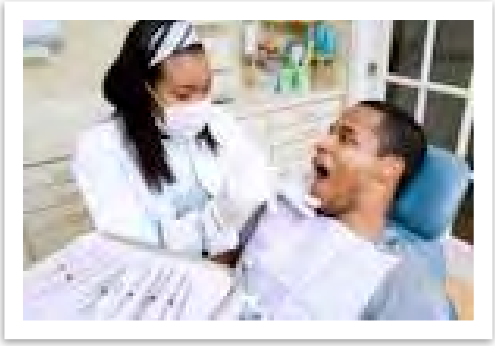


Dental professionals may be at risk for exposure to numerous workplace hazards. These hazards include, but are not limited to, the spectrum of bloodborne pathogens, pharmaceuticals and other chemical agents, human factors, ergonomic hazards, noise, vibration, and workplace violence.

There are currently no specific Occupational Health and Safety Administration (OSHA) standards for dentistry. However, exposure to numerous biological, chemical, environmental, physical, and psychological workplace hazards that may apply to dentistry are addressed in specific standards for the general industry.

This course is designed to help provide a solid foundation for employees working in dental offices. It will look at the potential health risks of working in a dental setting and ways you, as an employee, can protect yourself and other co-workers from potential health problems. The course will also discuss ways to properly clean and sanitize common machinery in a dental laboratory.

Module 1: Understanding Dental Office Health Risks

Potential Health Hazards

Many dental care professionals are at risk for occupational exposure to a variety of hazardous chemicals and situations. Being unaware of the potential hazards in the work environment makes them more vulnerable to injury.

Let's take a closer look at some of the potential health hazards associated with working in a dental lab.

Methyl methacrylate - This is used in making dentures and plates. It can be absorbed into the body by inhalation, through the skin, and by ingestion. It is irritating to the eyes, skin, and respiratory tract. Repeated and prolonged exposure can cause skin sensitization and asthma, as well as adverse effects on the nervous system.

Electroplating chemicals - The process of electroplating can release hazardous contaminants into the air that pose a variety of risks to the dental lab worker. The contaminants include various acid and alkaline mists that can cause respiratory and skin problems.

Metals such as beryllium, chromium, cobalt, and nickel can cause lung problems. These metals in alloys are used for castings of bridge framework and other dental prosthesis components.

Repetitive motion disorders - A range of injuries to the muscles, tendons, nerves, ligaments and joints of arms, hands wrists, shoulders, neck and upper back are common in the dental office setting. These injuries result from damage to the body over a period of time. If not treated, they can result in chronic pain and permanent disability.

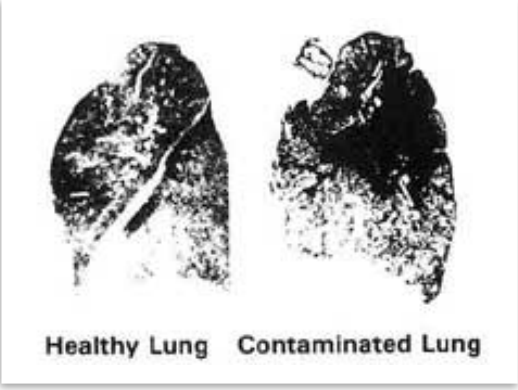
Noise- grinding, sandblasting, and other dental lab machinery can make noise that can cause hearing loss.

Chemical sterilants - These are used to sterilize impressions and prosthetic devices, received from dental offices, contaminated with blood and saliva. Sterilant chemicals include aldehydes, phenols, and quaternary ammonium compounds. These chemicals may cause lung problems and dermatitis.

Silicosis

Silicosis is a disabling and incurable lung disease, and can be diagnosed in dental laboratory workers. However, it is preventable. Silicosis is caused by breathing in fine dust containing crystalline silica. Once in the lungs, this dust then causes damage that stops the body from

using oxygen properly. Breathing in dust containing silica has been linked to other diseases, such as tuberculosis, kidney disease, and lung cancer.



Symptoms include:

- shortness of breath
- severe cough
- wheezing
- chest tightness

Dental labs materials that contain silica:

- sand
- investment materials
- porcelain
- shop dust

Controlling Silica Exposure

The best method to stop silica exposure is to eliminate materials containing crystalline silica. However, this method is not feasible for sandblasting machines. In this case, aluminum oxide is one of the many acceptable substitutions to silica.

When there are no good substitutes, dust exposure should be minimized through the use of local exhaust ventilation systems. These systems capture dust and transport it to a dust collection system.

The worker should also wear a respirator when other control methods are not available or do not work properly. The type of respirator recommended is, at a minimum, a half-mask air-purifying respirator with type N-100 particulate filters.

Wet wiping, wet moping, and vacuuming with a HEPA vacuum are also recommended. Dry sweeping, dry dusting, use of compressed air, and use of ordinary vacuum cleaners should be avoided because they reintroduce the dust into the air.

Beryllium

Beryllium, atomic number 4, is a brittle, steel-gray metal found as a component of coal, oil, certain rock minerals, volcanic dust, and soil. Beryllium is the second lightest of all metals and is used in a wide variety of applications. In its elemental form, beryllium has the unique properties of being light weight and extremely stiff. It is used as a metal alloy in dental appliances.

OSHA is concerned cases of chronic beryllium disease (CBD) are occurring among dental laboratory technicians working with dental alloys containing beryllium.

CBD is a serious lung disease that can be disabling and even fatal. The serious disease may occur among dental laboratory technicians when they inhale dust containing beryllium when working on items such as dental crowns, bridges, and partial denture frameworks made from dental alloys containing beryllium.

Chronic Beryllium Disease Symptoms

Symptoms of Chronic Beryllium Disease include:

- cough
- shortness of breath (especially with activity)
- chest pain
- fatigue
- weight loss
- loss of appetite

It is important to note NOT all individuals with these symptoms have CBD. These can be symptoms of other conditions which may also require medical attention. Not all people with CBD have all of these symptoms.

Scenario

A 53-year-old woman who had worked as a dental laboratory technician for 13 years was diagnosed with CBD in May 2000. From 1987 to 1995, her daily work involved sandblasting beryllium dental alloy, cutting the metal sprue from the alloy with a high-speed grinder, removing the bubbles with a hand-held electric grinder and deburrer, and setting the restoration to make sure it fit the die. While performing this work, the worker wore a surgical-type paper mask. Although a household-type wall vacuum system with movable hoses was available for cleanup, the laboratory was reported to be very dusty.

Beginning in 1996, the woman worked in a different dental laboratory, where her duties included the grinding of porcelain restorations, sandblasting, metal finishing, and polishing restorations with rouge. The dental technician also was involved in clean-up activities, which included using a household-type dry vacuum, emptying the bag daily by taking it outside and shaking it, washing the bag, and hanging it out-side to dry. Shaking the bag produced a dusty cloud. Although this lab used a beryllium dental alloy, it did so much less often than the dental laboratory where this worker had previously been employed. At the second laboratory, work was performed without the use of a mask or hood. Airborne beryllium samples were not taken at either of the dental laboratories where this woman worked.

In 1997, the laboratory technician was diagnosed as having sarcoidosis. The diagnosis was based on the results of additional diagnostic procedures that identified a positive beryllium lymphocyte proliferation test result and abnormal lung pathology, physiology and function. She is currently experiencing symptoms of CBD including dry cough, decreased energy, and shortness of breath after walking up one or two flights of stairs or after walking rapidly on a horizontal surface.

Possible Solutions

Controlling the exposure to beryllium can be done through engineering controls, work practices, and personal protective equipment (PPE).

Engineering Controls

Engineering controls are the first line of defense in employee protection. Therefore, employers should provide appropriate engineering controls, such as isolating the source and using ventilation systems to control dust. Employers also need to train their workers in work practices to ensure that dental laboratory technicians' exposures to beryllium are maintained below the current OSHA PELs.

Ventilation is one of the most important engineering controls available to the industrial hygienist and dentists for improving or maintaining the quality of the air in the occupational work environment. Broadly defined, ventilation is a method of controlling the environment with air flow.

A ventilation system, such as this one, is an example of an engineering control.

Work Practices

The following work practices should be used to ensure that the exposures of dental laboratory technicians to beryllium are reduced:

- Substitute work practices that generate less dust, such as hand filing, for procedures that produce more dust, such as power grinding.

- Use local exhaust ventilation (hoods) properly to minimize the generation of dust and fumes when working with beryllium-containing alloys.
- Use HEPA vacuums to clean equipment and the floor around the work area.
- Prohibit the use of compressed air to clean parts or working surfaces.
- If a wet mop is used for cleaning, do not leave a film of dust on the floor after the water dries.
- Limit the number of workers who have access to areas where beryllium-containing alloys are being cast or fabricated.
- Use appropriate respiratory protection.

Radiation Exposure

Many dental offices use x-ray machines because they are useful diagnostic tools to see potential damage and tooth disease in patients. According to the American Dental Association, dental x-ray exams are safe, but they do require very low levels of radiation exposure. This makes the potentially harmful effects very small to the patient.

Dental X-ray tools and techniques are designed to limit the body's exposure to radiation and every precaution is taken to ensure that radiation exposure is “as low as reasonably achievable” (the ALARA principle). Therefore, a leaded apron minimizes the patient exposure to the abdomen and should be used when any dental x-ray is taken.

Occupational exposure in dental settings is far lower than that in hospitals and medical offices. According to the National Council on Radiation Protection and Measurements (NCRP), the total limit for occupational exposure is 50 millisieverts (mSv) in one year. In addition, the lifetime occupational effective dose is limited to 10 mSv times the number of an individual’s age. The NCRP concludes that occupational exposure for dental personnel will not exceed these limits. For pregnant dental personnel, the radiation exposure limit is 0.5 mSv per month.

Radiation Safety Requirements

State laws and regulations set specific requirements for the use of ionizing radiation (which includes X-rays).

Contact the state radiation protection program to determine specific requirements for:

- inspection and testing for the facility, X-ray machine, radiation monitoring equipment and radiograph processing equipment
- permits or licensing
- supervision of personnel
- training or certification
- dental office design and radiation shielding
- record keeping
- equipment

Radiographic training requirements for dental office personnel frequently differ from and are less rigorous than those of medical personnel who take X-rays. Training requirements for dental office personnel typically are found in state dental practice acts or dental board regulations.

Bloodborne Pathogens

The Bloodborne Pathogens Standard (29 CFR 1910.1030) is the most frequently requested and referenced OSHA standard affecting medical and dental offices. Some basic requirements of this standard include:

- a written exposure control plan, to be updated annually
- use of universal precautions
- consideration, implementation, and use of safer, engineered needles and sharps
- use of engineering and work practice controls and appropriate personal protective equipment (gloves, face and eye protection, gowns)
- Hepatitis B vaccine provided to exposed employees at no cost
- medical follow-up in the event of an “exposure incident”
- use of labels or color-coding for items such as sharps disposal boxes and containers for regulated waste, contaminated laundry, and certain specimens
- employee training
- proper containment of all regulated waste

Occupational Exposure to Bloodborne Pathogens

An exposure can be defined as a percutaneous injury (needlestick or cut with a sharp object) or contact of mucous membrane or nonintact skin (exposed skin that is chapped, abraded, or with dermatitis) with blood, saliva, tissue, or other body fluids that are potentially infectious.

Exposure incidents might place dental health care personnel at risk for hepatitis B virus (HBV), hepatitis C virus (HCV), or human immunodeficiency virus (HIV) infection, and therefore should be evaluated immediately following treatment of the exposure site by a qualified health care professional.

When evaluating occupational exposures to fluids that might contain HBV, HCV, or HIV, health care workers should consider that all blood, body fluids, secretions, and excretions except sweat, may contain transmissible infectious agents. Blood contains the greatest proportion of infectious bloodborne virus particle titers of all body fluids and is the most critical transmission vehicle in the health-care setting.

During dental procedures, it is predictable that saliva will become contaminated with blood. If blood is not visible, it is still likely that very small quantities of blood are present, but the risk for transmitting HBV, HCV, or HIV is extremely small. Despite this small transmission risk, a qualified health care professional should evaluate any occupational exposure to saliva in dental settings, regardless of visible blood.

For more information on bloodborne pathogens in a healthcare setting, please take a look at OSHAcademy Course 656.

Risk of Infection after Occupational Exposure

Hepatitis B Virus (HBV)

Health care workers who have received hepatitis B vaccine and have developed immunity to the virus are at virtually no risk for infection. For an unvaccinated person, the risk from a single needlestick or a cut exposure to HBV-infected blood ranges from 6%–30% and depends on the hepatitis B e antigen (HBeAg) status of the source individual. Individuals who are both hepatitis B surface antigen (HBsAg) positive and HBeAg positive have more virus in their blood and are more likely to transmit HBV.

Hepatitis C Virus (HCV)

Based on limited studies, the estimated risk for infection after a needlestick or cut exposure to HCV-infected blood is approximately 1.8%. The risk following a blood splash is unknown but is believed to be very small; however, HCV infection from such an exposure has been reported.

Human Immunodeficiency Virus (HIV)

- The average risk for HIV infection after a needlestick or cut exposure to HIV-infected blood is 0.3% (about 1 in 300). Stated another way, 99.7% of needlestick/cut exposures to HIV-contaminated blood do not lead to infection.

- The risk after exposure of the eye, nose, or mouth to HIV-infected blood is estimated to be, on average, 0.1% (1 in 1,000).

- The risk after exposure of the skin to HIV-infected blood is estimated to be less than 0.1%. A small amount of blood on intact skin probably poses no risk at all. There have been no documented cases of HIV transmission due to an exposure involving a small amount of blood on intact skin (a few drops of blood on skin for a short period of time). The risk may be higher if the skin is damaged (for example, by a recent cut), if the contact involves a large area of skin, or if the contact is prolonged.

Protection after Occupational Exposure

Wounds and skin sites that have been in contact with blood or body fluids should be washed with soap and water; mucous membranes should be flushed with water. Immediate evaluation must be performed by a qualified health care professional.

Health care providers who evaluate exposed dental health care professionals should be:

- selected before dental health care professionals are placed at risk of exposure
- experienced in providing antiretroviral therapy
- familiar with the unique nature of dental injuries so they can provide appropriate guidance on the need for antiretroviral prophylaxis

Contact Dermatitis

Occupationally related contact dermatitis can develop from frequent and repeated use of hand hygiene products, exposure to chemicals, and glove use. Contact dermatitis is classified as either irritant or allergic. Irritant contact dermatitis is common, non-allergic, and develops as dry, itchy, irritated areas on the skin around the area of contact. By comparison, allergic contact dermatitis (type IV hypersensitivity) can result from exposure to accelerators and other chemicals used in the manufacture of rubber gloves as well as from exposure to other chemicals found in the dental practice setting. Allergic contact dermatitis often manifests as a rash beginning hours after contact and, like irritant dermatitis, is usually confined to the areas of contact.

Latex Allergies

Latex allergy (type I hypersensitivity to latex proteins) can be a more serious systemic allergic reaction. It usually begins within minutes of exposure but can sometimes occur hours later. It produces varied symptoms, which commonly include runny nose, sneezing, itchy eyes, scratchy throat, hives, and itchy burning sensations. However, it can involve more severe symptoms including asthma marked by difficult breathing, coughing spells, and wheezing; cardiovascular and gastrointestinal ailments; and in rare cases, anaphylaxis and death.

Dental health care personnel who are allergic to latex will need to take precautions at work and outside the workplace since latex is used in a variety of other common products in addition to gloves.

If diagnosed with allergy to natural rubber latex (NRL) protein:

- Avoid, as far as feasible, subsequent exposure to the protein and only use non-latex (nitrile or vinyl) gloves.
- Make sure that other staff members in the dental practice wear either non-latex or reduced protein, powder-free latex gloves.
- Use only synthetic or powder-free rubber dams.

Dental personnel can further reduce occupational exposure to NRL protein by taking the following steps:

- using reduced protein, powder-free latex gloves
- frequently changing ventilation filters and vacuum bags used in latex contaminated areas
- checking ventilation systems to ensure they provide adequate fresh or recirculating air
- frequently cleaning all work areas contaminated with latex dust
- educating dental staff on the signs and symptoms of latex allergies

Powder-Free Gloves

Proteins responsible for latex allergies are attached to glove powder. When powdered gloves are worn, more latex protein reaches the skin. Also, when gloves are put on or removed, particles of latex protein powder become aerosolized and can be inhaled, contacting mucous membranes. As a result, allergic dental health care personnel and patients can experience symptoms related to cutaneous, respiratory, and conjunctival exposure. Dental health care personnel can become sensitized to latex proteins after repeated exposure. Work areas where only powder-free, low-allergen gloves are used show low or undetectable amounts of allergy-causing proteins.

Patients with Latex Allergy

Patients with a latex allergy should not have direct contact with latex-containing materials and should be treated in a "latex safe" environment. Such patients also may be allergic to the chemicals used in manufacturing natural rubber latex gloves, as well as to metals, plastics, or other materials used to provide dental care. By obtaining thorough patient health histories and preventing patients from having contact with potential allergens, dental health care professionals can minimize the possibility of patients having adverse reactions.

Considerations in providing safe treatment for patients with possible or documented latex allergy include (but are not limited to) the following:

- Screen all patients for latex allergy: obtain their health history and provide medical consultation when latex allergy is suspected.
- Be aware of some common predisposing conditions: spina bifida, urogenital anomalies, or allergies to avocados, kiwis, nuts, or bananas.
- Be familiar with the different types of hypersensitivity—immediate and delayed—and the risks that these pose for patients and staff.
- Consider sources of latex other than gloves. Dental patients with a history of latex allergy may be at risk from a variety of dental products including, but not limited to, prophylaxis cups, rubber dams, and orthodontic elastics.

- Provide an alternative treatment area free of materials containing latex. Ensure a latex-safe environment or one in which no personnel use latex gloves and no patient contact occurs with other latex devices, materials, and products.

- Remove all latex-containing products from the patient's vicinity. Adequately cover/isolate any latex-containing devices that cannot be removed from the treatment environment.

- Be aware that latent allergens in the ambient air can cause respiratory and or anaphylactic symptoms in people with latex hypersensitivity. Therefore, to minimize inadvertent exposure to airborne latex particles among patients with latex allergy, try to give them the first appointments of the day.

- Frequently clean all working areas contaminated with latex powder/dust.

- Frequently change ventilation filters and vacuum bags used in latex-contaminated areas.

- Have latex-free kits, such as dental treatment and emergency kits, available at all times.

- Be aware that allergic reactions can be provoked from indirect contact as well as direct contact (for example, being touched by someone who has worn latex gloves). Hand hygiene, therefore, is essential.

- Communicate latex allergy procedures to other personnel to prevent them from bringing latex-containing materials into the treatment area.

- If latex-related complications occur during or after the procedure, manage the reaction and seek emergency assistance as indicated. Follow current medical emergency response recommendations for management of anaphylaxis.

Module 1 Quiz

Use this quiz to self-check your understanding of the module content. You can also go online and take this quiz within the module. The online quiz provides the correct answer once submitted.

1. **Breathing in dust containing silica has been linked to other diseases, such as _____.**

    a. measles
    b. tuberculosis
    c. lung cancer
    d. both b and c are correct

2. **All of the following are symptoms of chronic beryllium disease, except _____.**

    a. shortness of breath
    b. weight loss
    c. weight gain
    d. loss of appetite

3. **_____is/are the first line of defense in employee protection against chronic beryllium disease.**

    a. Engineering controls
    b. Work practices
    c. Personal protective equipment
    d. Elimination

4. **Latex allergies ALWAYS begin within minutes of exposure.**

    a. True
    b. False

5. **The average risk for HIV infection after a needlestick or cut exposed to HIV-infected blood is _____.**

    a. 90% (most likely you'll get HIV)
    b. .03% (about 1 in 300)
    c. 99.7% (odds are great)
    d. 10% or about 1 in 10 chance

Module 2: Cleaning and Worker Protection

Introduction

A dental office has several different types of tools on site. Therefore, keeping them sanitized and cleaned on a daily basis will protect both the patient and the dental office staff. This module will look at specific cleaning techniques and how to protect yourself and your patients from serious illnesses.

Personal Protective Equipment

During procedures that could generate splashes or sprays of blood or body fluids, dental workers must wear a surgical mask that covers both the nose and mouth and protective eyewear with solid side shields or a face shield. Protective eyewear for patients also shields their eyes from debris generated during dental procedures.

When a surgical mask becomes wet from exhaled moist air; the resistance to airflow through the mask increases. This causes more airflow to pass around edges of the mask.

If the mask becomes wet, it should be changed between patients or even during patient treatment, when possible.

In addition, employees should:

- Wash their face, hands, and forearms before eating, drinking, smoking, or applying cosmetics.
- Do not take food items, drinks, cosmetics, or tobacco products into the work area.
- Use gloves and arm sleeves to minimize skin exposure.
- Do not enter the eating area wearing protective clothing unless properly cleaned beforehand.
- Store street clothes separately from work clothes in a clean area.
- Keep their work clothes as clean as possible during the work shift.

- Vacuum their work clothing before removal (clothes must not be cleaned by blowing or shaking).
- Wipe off their shoes before leaving the work area if booties are not worn.
- Do not leave the workplace wearing protective work clothing or equipment or take it home for laundering.

Central Instrument Processing Area

In dental health care settings, all instrument cleaning, disinfecting, and sterilizing should occur in a designated central processing area in order to more easily control quality and ensure safety.

The instrument processing area should be physically divided into the following sections:

1. receiving, cleaning, and decontamination
2. preparation and packaging
3. sterilization
4. storage

This division is designed to contain contaminated items in an area designed specifically for cleaning, therefore preventing contamination of the clean areas where packaging, sterilization, and storage of sterile items occurs. Reusable contaminated instruments and devices are received, sorted, and cleaned in the cleaning area. The packaging area is for inspecting, assembling, and packaging clean instruments in preparation for final processing. The sterilization and storage areas contain the sterilizers and related supplies, as well as incubators for analyzing spore tests, and can contain enclosed storage for sterile items and disposable items.

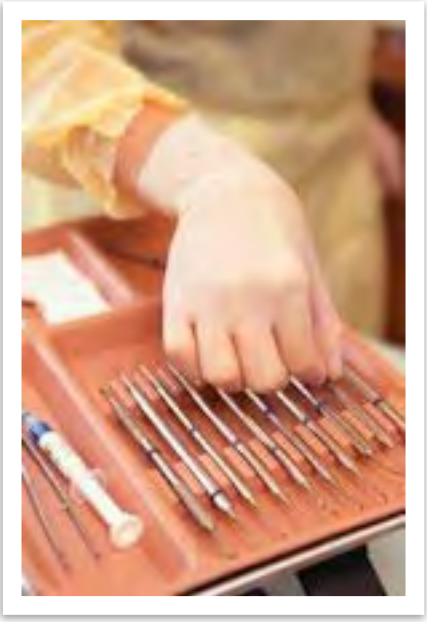
When it is not possible to have physical separation of these areas, clearly labeling each area might be satisfactory if the personnel who process the instruments are trained in work practices to prevent contamination of clean areas.

Cleaning Instruments Before Sterilization

Cleaning should precede all disinfection and sterilization processes in dental instruments. The necessary cleaning involves the removal of debris (organic or inorganic) from an instrument or device. If visible debris is not removed, it will interfere with microbial inactivation and can compromise the disinfection or sterilization process.

Manual vs. Automated Instrument Cleaning

Debris can be removed from an instrument either by scrubbing the instrument manually with a surfactant or detergent and water or by using automated equipment (ultrasonic cleaner or washer-disinfector) and chemical agents. After cleaning, instruments should be rinsed with water to remove chemical or detergent residue. Splashing should be minimized during rinsing and cleaning.



Considerations in selecting cleaning methods and equipment include their effectiveness, their compatibility with the items to be cleaned, and the occupational health and exposure risks they pose. Because instruments cleaned with automated cleaning equipment do not need to be presoaked or scrubbed, the use of automated equipment can increase productivity, improve cleaning effectiveness, and decrease worker exposure to blood and body fluids. Therefore, using automated equipment can be more efficient and safer than manually cleaning contaminated instruments.

If manual cleaning is not performed immediately, instruments should be placed into a container and soaked with a detergent, a disinfectant/detergent, or an enzymatic cleaner to prevent drying of patient material and make manual cleaning easier and less time consuming. The Centers for Disease Control (CDC) also recommends using long-handled brushes to keep the hand as far away as possible from sharp instruments.

Personal Protective Equipment while Cleaning

Instruments should be handled as though contaminated until processed through the sterilization cycle. This needs to be done unless the instrument has been processed with a thermal washer/disinfector that has a high-level disinfection cycle. To avoid injury from sharp instruments, personnel should wear puncture-resistant, heavy-duty utility gloves when handling or manually cleaning contaminated instruments and devices. Because splashing is

likely to occur, they should also wear a facemask, eye protection or face shield, and gown or jacket. Employees should not reach into trays or containers holding sharp instruments that cannot be seen. To reduce their risk of injury, they should instead remove instruments using forceps or empty them onto a towel.

Housekeeping Surfaces

Evidence does not support that housekeeping surfaces (floors, walls, and sinks) pose a risk for disease transmission in dental health-care settings. Actual, physical removal of microorganisms and soil by wiping or scrubbing is probably as critical, if not more so, than any antimicrobial effect provided by the agent used. The majority of housekeeping surfaces need to be cleaned only with a detergent and water or an EPA-registered hospital disinfectant/detergent, depending on the nature of the surface and the type and degree of contamination.

Schedules and methods vary according to the area (dental operatory, laboratory, bathrooms, or reception rooms), surface, and amount and type of contamination.

Cleaning and Disinfection Strategies for Blood Spills

The majority of blood contamination events in dentistry result from spatter during dental procedures using rotary or ultrasonic instrumentation. Although there is no evidence supporting Hepatitis B, Hepatitis C, or HIV have been transmitted from a housekeeping surface, prompt removal and surface disinfection of an area contaminated by either blood or other bloodborne pathogens are appropriate infection-control practices and required by OSHA.

Strategies for decontaminating spills of blood and other body fluids differ by setting and volume of the spill. Blood spills on either clinical contact or housekeeping surfaces should be contained and managed as quickly as possible to reduce the risk of contact by patients and dental workers. The person assigned to clean the spill should wear gloves and other PPE as needed. Visible organic material should be removed with absorbent material, such as disposable paper towels discarded in a leak-proof, appropriately labeled container. Nonporous surfaces should be cleaned and then decontaminated with either an EPA-registered hospital disinfectant effective against HBV and HIV or an EPA-registered hospital disinfectant.

Dental Unit Waterlines, Biofilm, and Water Quality

Studies show dental unit waterlines (narrow-bore plastic tubing that carries water to the high-speed handpiece, air/water syringe, and ultrasonic scaler) can become colonized with microorganisms, including bacteria, fungi, and protozoa. These microorganisms colonize and replicate on the interior surfaces of the waterline tubing and form a biofilm, which serves as a reservoir. The reservoir can increase the number of free-floating (i.e., planktonic) microorganisms in water used for dental treatment.

Extracted Teeth Disposal

Extracted teeth that are being discarded are subject to the labeling provisions of the OSHA Bloodborne Pathogen Standard. OSHA considers extracted teeth to be potentially infectious material that should be disposed into medical waste containers.

Extracted teeth containing amalgam should not be placed in a medical waste container that uses an incinerator for final disposal. State and local regulations should be consulted regarding disposal of amalgam.

Many metal recycling companies will accept extracted teeth with amalgam. Contact a recycler and ask about their policies and any specific handling instructions they may have. Extracted teeth may be returned to the patients upon request and are not subject to the provisions of the OSHA Bloodborne Pathogens Standard.

Hand Hygiene

Hand hygiene is a general term that applies to routine hand washing, antiseptic hand wash, antiseptic hand rub, or surgical hand antisepsis.

Hand hygiene substantially reduces potential pathogens on the hands and is considered a primary measure for reducing the risk of transmitting organisms to patients and health care

personnel (HCP). Hospital-based studies have shown noncompliance with hand hygiene practices is associated with health care-associated infections and the spread of multi-resistant organisms. Studies also have shown that the prevalence of health care-associated infections *decreased* as hand hygiene measures improved.

Indications for hand hygiene include the following:

- before and after treating each patient (e.g., before glove placement and after glove removal)
- after barehanded touching of inanimate objects likely to be contaminated by blood, saliva, or respiratory secretions
- before leaving the dental operatory
- when hands are visibly soiled
- before re-gloving and after removing gloves that are torn, cut, or punctured

Also, for oral surgical procedures, perform surgical hand antisepsis before donning sterile surgical gloves.

Storing Hand Care Products

Hand care products, including plain (non-antimicrobial) soap and antiseptic products, can become contaminated or support the growth of microorganisms. Liquid products should be stored in closed containers and dispensed from either disposable containers or containers that are washed and dried thoroughly before refilling. Soap should not be added to a partially empty dispenser, because this practice of "topping off" might lead to bacterial contamination of soap and negate the beneficial effect of hand cleaning and disinfection. Store and dispense products according to manufacturer's instructions.

Hand Lotions and Gloves

Petroleum-based lotion formulations can weaken latex gloves and increase permeability. However, lotions are often recommended to ease the dryness resulting from frequent hand washing and more recently to prevent dermatitis resulting from glove use. The primary defense against infection and transmission of pathogens is healthy unbroken skin.

Frequent hand washing with soaps and antiseptic agents can cause chronic irritant contact dermatitis among dental health care personnel. The potential of detergents to cause skin irritation can vary considerably, but can be reduced by adding emollients. Lotions that contain petroleum or other oil emollients should only be used at the end of the workday. If using lotions during the workday, select a water-based product. At the time of product selection, information should be obtained from the manufacturer regarding interaction between gloves, lotions, dental materials, and antimicrobial products.

Module 2 Quiz

Use this quiz to self-check your understanding of the module content. You can also go online and take this quiz within the module. The online quiz provides the correct answer once submitted.

1. **During procedures, dental workers must wear _____ and _____ to protect against splashes of blood or body fluids.**

    a. surgical mask, protective eyewear
    b. apron, mask
    c. face shield, apron
    d. gloves, protective eyewear

2. **What should dental workers do if their mask becomes wet during a procedure?**

    a. Throw it out
    b. Keep it on until the procedure is finished
    c. Changed between patients
    d. Wash it

3. **The _____ area is for inspecting and assembling clean instruments.**

    a. sterilization
    b. storage
    c. preparation and packing
    d. decontamination

4. **What should be done immediately after cleaning an instrument?**

    a. The instruments should be rinsed with water
    b. Let them air dry
    c. Nothing, you have completed the cleaning process
    d. The instruments should be rinsed with bleach

5. _____ should precede all disinfection and sterilization processes in dental instruments.

a. Cleaning
b. Rinsing
c. Scrubbing
d. Sorting