Infection Control in Practice

Creating a Successful Infection Control Program

"Antisepsis relieved patients from the terrors of death and gave to the surgeon restful nights and joyous days." - William Williams Keen (first U.S. brain surgeon)

Doctors once depended on a tassel of tarred rope, a hare’s foot, or a dried toad on the chest to prevent disease transmission. The discovery of the microscopic pathogens that cause infection gave healthcare workers not only the knowledge of how disease is spread, but the key to preventing and reducing the risk of transmission.

The goal of an infection control program is to prevent or reduce the risk of disease transmission among patients and staff.

Those of us in the dental profession have exposure to disease-producing pathogens during our daily work. Exposure to pathogens may occur through contact with blood, oral and respiratory secretions, or contaminated equipment. Fortunately, we can minimize this risk through the use of proper infection control procedures. We can better reduce the risk or even prevent disease transmission by understanding how diseases are transmitted.

Chain of Infection

A model we will use to make it easier to understand disease transmission is the “chain of infection.” Visualize a chain with five links. Each link represents one of the five necessary conditions for disease transmission. Like any chain, if one link is broken, the chain falls apart. In the case of disease transmission, all of the conditions (links) in the chain of infection must be present for disease transmission to occur.

While none of us want to be known as the “weakest link,” we need to understand the chain of infection and start with the easiest links to break, such as ensuring we are immunized against vaccine-preventable diseases. In addition, every day that we practice our profession we need to be on the lookout for links we must break to prevent disease.

So what are the links in the chain of infection? Link one is that there must be sufficient numbers of microorganisms, or pathogens, to cause a disease. Some pathogens are more virulent than others. For example, hepatitis B can be highly transmissible and even a small amount of infected body fluids may cause hepatitis B virus infection.

Link two, a source where pathogens are able to supply and multiply, must be available. The bloodstream or a dental unit waterline are examples.

The third link is that there must be a way for the pathogen to leave its reservoir (such as the blood of a patient) and reach a new host (such as the dental worker). There are four possible modes of transmission:

1. Direct contact with infected saliva, blood or lesions.
2. Indirect contact with contaminated objects such as instruments, operatory equipment, or environmental surfaces.
3. Droplet transmission, in which spray or spatter containing microorganisms travels a short distance before settling on mucous membranes of the eyes, nose, or mouth.

Learning Objectives

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

- identify the purpose of an infection control program.
- list the five conditions in the chain of infection.
- describe the four principles of infection control.

Please forward this issue of ICIP to anyone you feel will find it of interest.
Creating a Successful Infection Control Program

continued from front cover

4. Airborne transfer of aerosolized microorganisms, which can remain suspended in the air for long periods of time.

Link four is the portal of entry. Pathogens must have a way to enter the body to cause infection. For example, pathogens can enter the body through a percutaneous injury such as a needlestick, through contact with the mucous membranes of the eyes, nose, mouth, or through contact with non-intact skin.

The fifth and final condition or link in the chain of infection is the availability of a susceptible host. This is an individual who is not immune to the disease through vaccination or natural immunity.

Diseases can be transmitted along the chain of infection in several directions:

- Patient to dental staff;
- dental staff to patient; or
- patient to patient.

The risk of disease transmission from patient to dental staff is the more likely of the three because dental staff have frequent contact with patients’ saliva and blood during dental procedures. The least likely would be patient to patient transmission.

The four principles of infection control

Fortunately the chain of infection is easy to break with the help of the four principles of infection control. These principles apply principles of common sense and are easy to understand and implement in daily dental practice...

1. Take Action to Stay Healthy

Prevent disease transmission through immunizations, appropriate work restrictions, and the practice of hand hygiene.

2. Avoid Contact with Blood and Body Fluids

Use standard precautions, engineering controls, and work practice controls. This principle also emphasizes the use of personal protective equipment (PPE) to prevent bloodborne exposure, and the management of postexposure incidents.

3. Make Objects Safe for Use

Thoroughly clean and sterilize patient-care items and use single-use or disposable items.

4. Limit Contamination

Use barriers or clean and disinfect environmental surfaces, minimize sprays and splashes, properly dispose of medical waste, and maintain water quality in dental unit waterlines.

Good infection control practices break any of the links in the chain of infection, thereby preventing disease transmission.

By following the four principles of infection control, we can prevent or reduce the risk of disease transmission among patients and dental staff. To learn more about how these principles break the change of infection, go to the new OSAP online infection control course From Policy to Practice: OSAP’s Interactive Guide to the CDC Guidelines.

— OSAP
Compliance Corner

Compliance Assistance Quick Start

Quick Start has a specific section on Health Care. It links the user to many OSHA compliance and assistance documents. Quick Start puts all these resources in one place, saving valuable search time. The seven steps lead the user through the process of determining which regulations apply to their workplace.

Please note that Quick Start is not a standard or regulation, and creates no new legal obligations. It is advisory in nature, informational in content, and intended to assist employers in providing a safe and healthy workplace through effective compliance and prevention programs adapted to the needs of individual places of employment. If you are in a state with an OSHA-approved state program, you are subject to state occupational safety and health regulations that may have more stringent or supplemental requirements. These state programs also provide compliance assistance services. Go to www.osha.gov/dcsp/osp/index.html for additional information.

You can also request a free, confidential, on-site consultation from the OSHA Consultation Program. Go to www.osha.gov/dcsp/smallbusiness/consult.html to learn more about this program.

Cutting Edge

National Influenza Vaccination Week
Because the influenza vaccination is such an important strategy for public health, the Centers for Disease Control and Prevention (CDC) set the week after Thanksgiving, November 27 to December 2, as National Influenza Vaccination Week. This event is designed to highlight the influenza (flu) vaccination and encourage all identified risk groups to obtain it. Tuesday, November 27, 2007, is Children’s Flu Vaccination Day, with a focus on vaccinating high-risk children. Each year, over 20,000 children under age 5 are hospitalized as a result of influenza. http://www.cdc.gov/flu/nivw/index.htm.

WHO Director-General to Kick Off 60th Anniversary of NIDCR
Dr. Margaret Chan, Director-General of the World Health Organization, will deliver the David E. Barnes Global Health Lecture on Monday, December 10 at the NIH campus in Bethesda, MD. The title of her lecture is “Climate Change and Health.”

The lecture will be videocast live at: http://videocast.nih.gov/

The annual lecture series honors the late David E. Barnes, a long-standing World Health Organization employee, special expert for international health in the NIDCR Office of International Health, and ardent spokesman for global health. The lecture is jointly sponsored by the NIDCR and the Fogarty International Center.

Infection Control In Practice

Infection Control In Practice is a resource prepared for clinicians by the Organization for Safety & Asepsis Procedures with the assistance and expertise of its members. OSAP is a nonprofit, independent organization providing information and education on infection control and occupational health and safety to dental care settings worldwide.

Information in this issue has been brought to you with the help of the following individuals:

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20,000 children under age 5 are hospitalized as a result of influenza.
OSAP Chart & Checklist

**Infection Control Overview**

Every dental practice setting can create a successful infection control program by:

1. Reviewing "From Policy to Practice: OSAP's Interactive Guide to the CDC Guidelines" - it's online and it's free ([www.OSAP.org](http://www.OSAP.org)), and
2. Being able to answer "yes" to the questions listed in the table below.

The OSAP online infection control course consists of seven modules. Each module includes topics and questions that will help you develop or update an effective infection control program.

<table>
<thead>
<tr>
<th>Modules</th>
<th>Topics</th>
<th>Questions</th>
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</table>
| Importance of Infection Control| • Chain of infection  
• Principles of infection control | Does you dental practice have:  
A copy of the 2003 CDC Guidelines?  
A written infection control (IC) program?  
Someone responsible for developing and updating the IC program?  
An IC education plan that includes regularly scheduled training? |
| Take Action to Stay Healthy    | • Personnel health elements  
• Immunizations  
• Work restrictions  
• Hand hygiene  
• Irritant and allergic contact dermatitis  
• Latex allergy | Do you know:  
The occupational risk associated with your work duties?  
Contact information for your practice's qualified healthcare provider?  
Which immunizations are required and which are recommended?  
If your immunizations are up-to-date?  
When and how to use each hand hygiene method?  
If you have ever reacted to latex?  
**Can you** identify dental products that may contain latex?  
**Do you** monitor your hands for skin reactions?  
**Have you** had infection control training in the last 6 months? |
| Avoid Contact with Blood and Other Body Fluids | • Bloodborne pathogens  
• Standard precautions  
• Engineering controls  
• Administrative controls  
• Personal protective equipment (PPE)  
• Work practice controls  
• Exposure prevention  
• Postexposure management | **In your practice, do you know:**  
Where to find the written policies, procedures, and practices for standard precautions, PPE, bloodborne pathogens, and postexposure management?  
What types of engineering controls are used?  
If the engineering controls are used correctly?  
How to manage exposures to bloodborne pathogens?  
If correct procedures were followed the last time an exposure occurred?  
**Have you:**  
Recently taken infection control training?  
Identified any changes you will make to your practice's PPE selection?  
Had 3 doses of the hepatitis B vaccine?  
**Does your** dental practice evaluate safer needle devices? |
| Make Objects Safe for Use      | • Patient-care items  
• Single-use or disposable items  
• Instrument processing  
• Sterilization  
• Dental handpieces and other devices attached to air and waterlines | **Do you know:**  
The types of sterilization used in your dental practice?  
What to do if you have a positive test for spores?  
Of anything you should do to update the procedures for sterilization and disinfection in your office?  
**Does your office:**  
Have written policy & procedures for sterilization of patient-care items?  
Have an instrument processing center divided into "dirty" and "clean" areas?  
Maintain sterilization equipment according to manufacturer's instructions?  
Use mechanical, chemical and biological indicators?  
Have a written procedure to manage sterilization failure?  
Use single-use disposable devices?  
Heat sterilize handpieces and devices attached to air and waterlines? |
| Limit Contamination            | • Environmental infection control  
• Regulated and non-regulated medical waste  
• Dental unit water quality  
• Boil water advisory | **Do you know:**  
Office policy for disinfecting or using barriers on clinical contact surfaces?  
Which products are EPA-registered hospital, low and intermediate-level disinfectants?  
Office policy for regulated and non-regulated medical waste?  
Local, state, and/or federal regulations for disposal of regulated medical waste?  
How water quality in dental unit waterlines is assured in your office?  
How to maintain and monitor water quality in dental unit waterlines?  
What to do if there is a boil water advisory?  
**Have you** had training on the use of disinfectants? |
Putting It All Together

**Staying up-to-date on requirements & recommendations**

Dental staff can learn about and stay current on recommended infection control practices by:
- Reading and complying with federal, state, and local regulations.
- Attending education and training programs on infection control.
- Following CDC guidelines to develop or update infection control policies and procedures for their dental practices.
- Reading professional journals.
- Sharing Best Practices.

**OSHA**

Let’s briefly review infection control practices required by OSHA and recommended by CDC guidelines.

OSHA is responsible for developing regulations to ensure the safety of workers in the United States. OSHA requires employers to provide safe working environments for employees. OSHA has specific regulations and requirements for the protection of workers in health care settings, including dentistry. You may be familiar with these OSHA requirements for dental practices:

- Written infection control program
- Hepatitis B vaccine
- Engineering controls
- Work practice controls
- PPE
- Preventive exposure management
- Selection and use of safety devices

OSHA relies upon the expertise of CDC. Why? Because CDC is the public health authority in the United States, and its mission is to protect the health of the public.

In 1986 and 1993, expert working groups and CDC staff developed infection control guidelines for dentistry. In 2003, CDC published updated guidelines and recommendations that reflect new research, changes in technology, and consistency with other CDC guidelines.

**CDC Guidelines for Infection Control in Dental Health-Care Settings, 2003** is divided into two parts:

**Part One** describes the scientific support for the recommendations. **Part Two** lists rankings with the recommendations. The rankings reflect the strength of the scientific support for each of the recommendations. Every dental professional should read and retain a copy of CDC Guidelines for Infection Control in Dental Health-Care Settings, 2003.

OSHA requirements

- Written infection control program
- Hepatitis B vaccine for dental healthcare personnel who are at risk for bloodborne exposure
- Engineering and work practice controls
- Personal protective equipment (PPE), also known as personal barrier protection, used during patient care

CDC recommendations

- Develops guidelines
- Sets the minimum standard of practice to protect both patients and dental health care personnel
- Guidelines adopted as regulation under state dental licensing boards

Infection Control Practices

- Prevention and limitation of occupational exposures to hazards in the workplace and proper management of exposure incidents when they occur
- Selection and use of appropriate safety devices to prevent sharps injuries and exposures to blood and potentially infectious materials

Go to the OSHA website at www.osha.gov/SLTC/dentistry for more information about OSHA regulations.

Go to www.osha.gov/SLTC/dentistry/index.html to obtain a copy.

Continued from page 4
Administrative controls: The use of administrative measures (that is, policies and procedures) to reduce the risk of exposure to pathogenic organisms.

Engineering controls: Controls that isolate or remove the bloodborne pathogens hazard from a workplace; examples include sharps disposal containers and safer medical devices (such as self-sheathing needles and needleless systems).

Immunity: Protection against a disease; indicated by the presence of antibodies in the blood, which usually can be identified with a laboratory test.

Medical waste: Waste generated through the provision of medical or dental care; may be regulated or non-regulated.

Parenteral: Means of piercing the mucous membranes or the skin barrier through events such as needlestick, human bite, cut or abrasion.

Regulated medical waste: Waste generated through the delivery of medical or dental care that requires special handling and disposal because it can cause infection or physical harm (for example, blood- or saliva-soaked cotton rolls, extracted teeth, sharp items, surgically removed hard and soft tissues).

Standard precautions: Practices and procedures that integrate and expand the elements of universal precautions into a standard of care designed to protect health care workers and patients from pathogens that can be spread by blood or any other body fluid, excretion, or secretion; applies to contact with blood; all body fluids, secretions, and excretions (except sweat), regardless of whether they contain blood; nonintact skin; and mucous membranes.

Work practice controls: Practices that reduce the likelihood of exposure by changing the manner in which a task is performed (for example, recapping needles with a one-handed scoop technique instead of using two hands).

Glossary

Occupational Safety and Health Administration [www.osha.gov/SLTC/dentistry](http://www.osha.gov/SLTC/dentistry)
Provides information about standards, how workplace hazards can be recognized, and how workplace hazards can be controlled and prevented.

CDC Guidelines for Infection Control in Dental Health-Care Settings, 2003 [http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5217a1.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5217a1.htm)
Reviews the scientific evidence regarding dental infection control issues and provides consensus, evidence-based recommendations.

Slide Series on CDC Guidelines [http://www.cdc.gov/oralhealth/infectioncontrol/guidelines/ppt.htm](http://www.cdc.gov/oralhealth/infectioncontrol/guidelines/ppt.htm)
This slide set and accompanying speaker notes provide an overview of many of the basic principles of infection control that are contained in CDC Guidelines for Infection Control in Dental Health-Care Settings, 2003. It can be downloaded as a PowerPoint presentation or viewed on the website.

Best Practices

Occupational Safety and Health Administration [www.osha.gov/SLTC/dentistry](http://www.osha.gov/SLTC/dentistry)
Provides information about standards, how workplace hazards can be recognized, and how workplace hazards can be controlled and prevented.

CDC Guidelines for Infection Control in Dental Health-Care Settings, 2003 [http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5217a1.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5217a1.htm)
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This slide set and accompanying speaker notes provide an overview of many of the basic principles of infection control that are contained in CDC Guidelines for Infection Control in Dental Health-Care Settings, 2003. It can be downloaded as a PowerPoint presentation or viewed on the website.
If you wish to obtain one (1) hour of continuing education (CE) credit, complete the following test by selecting the best answer and fax or mail it to the OSAP Central Office for grading. Please include a check or credit card to cover handling charges. Pending satisfactory results (at least seven out of ten), you will be issued a letter for one (1) CE credit hour. OSAP is recognized by the American Dental Association as a CERP Provider. For more information, call OSAP at 800-298-6727 (410-571-0003).

For each question, pick the best answer.

1. Transmission of a disease by way of sprayed or spattered patient materials that land on mucous membranes is called:
   a. direct contact  
   b. indirect contact  
   c. droplet transmission  
   d. airborne transmission

2. Which of the following is not a link in the chain of infection?
   a. a pathogen in sufficient numbers  
   b. a mode of transmission for the pathogen  
   c. an immune host  
   d. a portal of entry

3. It is most likely that diseases would be transmitted from:
   a. patient to dental staff  
   b. dental staff to patient  
   c. patient to patient  
   d. none of the above

4. Disease transmission occurs when the following conditions are present:
   a. pathogen, source, and portal of entry  
   b. source, susceptible host, and pathogen  
   c. pathogen, source, mode of transmission, portal of entry, and susceptible host  
   d. susceptible host, mode of transmission, and portal of entry

5. Transmission of disease by contact with contaminated objects such as instruments, operatory equipment, or environmental surfaces is called:
   a. direct contact  
   b. indirect contact  
   c. droplet transmission  
   d. airborne transmission

6. Transmission of disease through contact of blood and other potentially infectious patient materials (OPIM) with non-intact skin is called:
   a. direct contact  
   b. indirect contact  
   c. droplet transmission  
   d. airborne transmission

7. It is least likely that diseases would be transmitted from:
   a. patient to dental staff  
   b. dental staff to patient  
   c. patient to patient  
   d. none of the above

8. The Take Action to Stay Healthy principle of infection control focuses on:
   a. standard precautions, engineering controls, and work practice controls  
   b. immunizations, work restrictions, and hand hygiene  
   c. sterilization of patient-care items and using single-use or disposable items  
   d. using barriers or cleaning and disinfecting environmental surfaces

9. The Making Objects Safe for Use principle includes:
   a. standard precautions, engineering controls, and work practice controls  
   b. immunizations, work restrictions, and hand hygiene  
   c. sterilization of patient-care items, and using single-use or disposable items  
   d. using barriers or cleaning and disinfecting environmental surfaces

10. Avoid Contact with Blood and Body Fluids involves:
    a. standard precautions, engineering controls, and work practice controls  
    b. immunizations, work restrictions, and hand hygiene  
    c. sterilization of patient-care items, and using single-use or disposable items  
    d. using barriers or cleaning and disinfecting environmental surfaces
One of the four principles of infection control is Make Objects Safe for Use. This principle works well when using disposable items while treating patients. Most dental practices make extensive use of disposable items such as patient drapes, water cups, saliva ejector tips, matrix bands, gloves, and masks, which are all discarded after each use. Some dental practices use packaged unit-dose products. These may include composites, bonding agents, cements, prophylaxis paste, rubber cups and other items.

You can expand the concept of unit-dose from a method for limiting contamination to a technique for improving the efficiency of a dental practice. Think of unit-dose as preparing and setting out supplies in the appropriate quantity before seating a patient. Unit-dose minimizes contact with and contamination of patient-care items and environmental surfaces during treatment. Additionally, the practice of using unit-dose assures that instrument set-ups are complete. This leads to more efficiency during treatment, reducing chair time and minimizing fatigue for the dental team and patients. This efficiency helps to keep the office running on schedule.

Applying this expanded concept of unit-dose begins at the packing of instrument set-ups for sterilization. Autoclavable, disposable, single-use items such as gauze, cotton rolls, or cotton tip applicators can be placed in a cassette prior to sterilization. Placing these disposable items in a cassette prior to sterilization will assure the items are readily available for patient treatment. This practice also prevents dental staff from leaving the operatory or reaching into a cabinet or drawer and possibly contaminating supplies or instruments.

When an operatory is set-up before a patient is seated, time is not wasted because treatment can start immediately. This is critical to increasing clinical efficiency. It also reduces unnecessary fatigue for dental staff and patients. The dental team is able stay on time for scheduled appointments, demonstrating to patients that their time is respected. Furthermore, dental staff will not have to work through their lunch breaks or stay late.

Emra Casuse CDA
Emra Casuse is a certified dental assistant who has worked for the Indian Health Service (IHS) for more than 25 years. She is the IHS Coordinator for Dental Assisting Education and has served in that position since 1996.

Do you have a practice tip you’d like to share with other OSAP members and subscribers? Send your suggestions for enhancing dental infection control and safety in practice to editor@OSAP.org. Be sure to include contact information, a photo, and a brief bio. Thanks!