Beyond the Bloodborne in Infection Control

Infectious Disease Update

“The time has come to close the door on infectious diseases.” US Surgeon General William H. Stewart, 1967

This famous quote from the top US public health official illustrates the optimism felt by many health professionals of that time about our ability to conquer infectious diseases. With the introduction of antibiotics and effective vaccinations, health professionals and the public felt confident that we were well on our way to a resounding victory over infectious diseases. Regrettably, the truth is far from the predictions of the 1960’s.

In just the past 30 years, a disturbing number of new, altered, or previously unrecognized infectious diseases from around the world have led us to reconsider our optimistic outlook. What does this mean to the dental team? Certainly, we all have concerns about our health and that of our families. In addition, because we are part of the larger healthcare team our patients have an expectation that we are familiar with current infectious diseases. The next time the media runs a story on an infectious disease such as Cruetzfeldt Jacob disease (a human form of mad cow disease) your patients may ask you what the chances are of getting this deadly disease from instruments used for the root canal procedure they are about to undergo. They may have heard that routine sterilization techniques do not destroy the agent that causes this disease. How will you reassure them that they are safe in your office?

Infectious Diseases
Historically, we have seen the most emphasis on preventing the transmission of bloodborne diseases in the dental office. This is arguably because Occupational Safety and Health Administration (OSHA) regulations for infection control address only those diseases transmitted through contact with blood. The truth is that in a typical day in the office we may encounter not only bloodborne but also airborne diseases and those carried in the saliva of patients. Among others, these diseases may include herpes simplex virus (HSV), influenza (flu), varicella (chickenpox), and Cytomegalovirus (CMV).

Anyone following today’s news knows that there is concern that an influenza pandemic like the one that killed over 500,000 people in the US and up to 50 million worldwide in 1918-1919 could happen again if avian flu virus (bird flu, also known as H5N1) mutates in a way that makes it more readily transmissible between humans. According to the Centers for...
Infectious disease update
continued from front cover

Disease Control and Prevention (CDC) Key Facts About Avian Influenza (Bird Flu) and Avian Influenza A (H5N1) Virus: “The H5N1 virus does not usually infect humans. In 1997, however, the first case of transmission from a bird to a human occurred during an outbreak of bird flu in poultry in Hong Kong. The virus caused severe respiratory illness in 18 people, 6 of whom died.” The potential consequences of some of these diseases are especially devastating to people who have underlying health problems such as respiratory disease or cancer, are pregnant, elderly or very young. The CDC maintains resource information about avian influenza on their website at www.cdc.gov/flu/avian/.

Drug Resistant Diseases
Diseases that fall into this category are those that were thought curable using pharmaceuticals. Disappointingly, some disease agents have the ability to adapt to the unfavorable conditions that the antibiotics produce, alter their structure, and become resistant to the effects of the medications.

The poster child of drug resistant organisms in healthcare settings is methicillin resistant Staphylococcus aureus (MRSA). This is a very common organism found on the skin and mucous membranes of carriers. Although most carriers of Staphylococcus aureus are healthy and show no ill effects caused by the organism, when it is transmitted from the hands of workers to a patient with an opening in their skin, it may cause devastating and difficult to treat infections including pneumonia, bloodstream infections and surgical wound infections.

In the absence of an effective vaccine, a person’s first line of defense against disease is his or her own immune system. When that fails and the disease takes hold we must rely on antimicrobial drugs to overcome the disease-causing organism. Without effective drug therapies, we may become defenseless against life threatening illnesses. Understanding the manner in which diseases are transmitted (chain of infection) is essential to preventing transmission regardless of whether the diseases are bloodborne, airborne, or transmitted via direct or indirect contact.

In recognizing the threat of emerging diseases on the health of all people, the CDC has an aggressive plan to expand domestic efforts in infectious disease prevention globally. In the executive summary of the CDC Global Infectious Disease Strategy the authors state: “Left unchecked, today’s emerging diseases can become the endemic diseases of tomorrow. This is what happened with HIV/AIDS, which spread from a remote part of Africa to all other continents 20 years ago, and is now entrenched all over the world, necessitating a major international control effort.”

Our vision of infection control must evolve in response to this global infectious disease landscape. The entire CDC document is available at www.cdc.gov/globalidplan.
Compliance Corner

CDC  Centers for Disease Control and Prevention

“The relevance of universal precautions to other aspects of disease transmission was recognized, and in 1996, CDC expanded the concept and changed the term to standard precautions. Standard precautions integrate and expand the elements of universal precautions into a standard of care designed to protect HCP and patients from pathogens that can be spread by blood or any other body fluid, excretion, or secretion. Standard precautions apply to contact with 1) blood; 2) all body fluids, secretions, and excretions (except sweat), regardless of whether they contain blood; 3) nonintact skin; and 4) mucous membranes. Saliva has always been considered a potentially infectious material in dental infection control; thus, no operational difference exists in clinical dental practice between universal precautions and standard precautions.”

CDC. Guidelines for Infection Control in Dental Health-Care Settings – 2003 MMWR, December 19, 2003:52(RR-17)

Glossary

Pandemic: An epidemic occurring over a very wide area (several countries or continents) and usually affecting a large proportion of the population.

Methicillin: An antibiotic drug of the penicillin family historically used in the treatment of certain staphylococcal infections. Although no longer widely used, it retains significance in the identification of certain resistant strains of Staphylococcus aureus.

Avian flu: A type of influenza virulent in birds. First identified in Italy in the early 1900s, it now exists worldwide. A particularly dangerous form of avian flu known as H5N1 (for the types of proteins found in its coat) has become epidemic in domestic poultry in Asia. Although the current strain is not easily spread among humans, it has a high rate of mortality when contracted by humans.

Herpes simplex virus: The Herpes simplex virus infection (common names: herpes, cold sores) is a common, contagious, incurable, and in some cases sexually transmitted disease caused by a double-stranded DNA virus. The infection can also affect the brain, eyes and skin.

Cytomegalovirus: A type of human herpesviruses, also known as human herpesvirus 5 (HHV-5). CMV is most likely to cause disease in patients with immune deficiency and in newborns.

Crustzfeldt Jacob disease: A degenerative, invariably fatal brain disorder also known as “classic CJD.” Typically, onset of symptoms occurs about age 60, and about 90 percent of patients die within a year. The disease-causing agent is an abnormal protein called a prion.
An important element in understanding infection control is the concept of the “chain of infection.” The chain of infection includes the elements necessary for disease transmission to be successful. Identifying and implementing infection control practices designed to prevent the spread of disease is the goal of the dental professional. In this section, we show some strategies for interrupting the chain of infection.

**CHAIN OF INFECTION**

**Pathogen**
An adequate number of pathogens, or disease-causing organisms, to cause disease.

**Control Strategies**
Immunization, pre- and post-exposure prophylaxis

**Reservoir**
A source that allows the pathogen to survive and multiply (e.g., skin, mucosa, body fluids and dental water systems).

**Control Strategies**
Hand antisepsis, pre-procedural mouthrinse, dental waterline maintenance

**Susceptible host**
A person who is not immune to the pathogen.

**Mode**
Provides a vehicle for infectious organisms to travel from the source to the host

**Control Strategies**
Hand antisepsis, surface disinfection, barriers, instrument decontamination and sterilization, safety devices, high-speed evacuation, dental dam

**Entry**
A path for a pathogen to enter the host.

**Control Strategies**
Eye protection, protective clothing, mask, engineering controls, sharps containers, heavy-duty gloves

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**Ask OSAP**

**Q:** What steps can I take to protect myself and my patients from getting the flu this year?

**A:** Many things you can do will help prevent you from getting sick during the flu season. In addition to standard precautions, the following recommendations from the CDC should help you remain healthy.

- *Get the flu vaccine.*
- *Avoid close contact with people who are sick.*
- *Stay home when you are sick.* If possible, stay home from work, school, and errands when you are sick. You will help prevent others from catching your illness.
- *Cover your mouth and nose.* Cover your mouth and nose with a tissue when coughing or sneezing. It may prevent those around you from getting sick.
- *Keep your hands clean.* Washing your hands often will help protect you from germs.
- *Avoid touching your eyes, nose or mouth.* The flu virus may spread when a person touches contaminated surfaces or objects and then touches his or her eyes, nose, or mouth. — OSAP

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Do you have an inquiry about infection control, occupational health, or practice safety? Ask OSAP. Send your questions to office@OSAP.org
### OSAP Chart & Checklist

Understanding the relevant information about the diseases of concern in the dental office is important in understanding risk and prevention. The chart below adapts information from numerous CDC fact sheets on infectious diseases.

<table>
<thead>
<tr>
<th>Disease</th>
<th>Risk Factors</th>
<th>Transmission</th>
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<tr>
<td>HIV/AIDS</td>
<td>• Sexual contact with an infected person&lt;br&gt;• Injecting drug use&lt;br&gt;• Infants born to infected mothers&lt;br&gt;• Breastfeeding infants of infected mothers&lt;br&gt;• Healthcare workers</td>
<td>• Unprotected sexual contact&lt;br&gt;• Sharing needles by injecting drug users&lt;br&gt;• Accidental sharps injuries in health care&lt;br&gt;• Accidental mucous membrane splashes in health care&lt;br&gt;• From infected mother to baby during birth</td>
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<td>Hepatitis B</td>
<td>• Multiple sex partners&lt;br&gt;• Men who have sex with men&lt;br&gt;• Injecting drug users&lt;br&gt;• Household contacts of chronically infected persons&lt;br&gt;• Infants born to infected mothers&lt;br&gt;• Hemodialysis patients&lt;br&gt;• Health care and public safety workers</td>
<td>• Same as above, and&lt;br&gt;• Sharing personal hygiene items in a home setting</td>
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<tr>
<td>Hepatitis C</td>
<td>• Injecting drug users&lt;br&gt;• Household contacts of chronically infected persons&lt;br&gt;• Hemodialysis patients&lt;br&gt;• Recipients of clotting factors before 1987&lt;br&gt;• Recipients of blood and/or organs before 1992&lt;br&gt;• People with undiagnosed liver problems&lt;br&gt;• Infants born to infected mothers</td>
<td>• Unprotected sexual contact&lt;br&gt;• Sharing needles by injecting drug users&lt;br&gt;• Accidental sharps injuries in health care&lt;br&gt;• Accidental mucous membrane splashes in health care&lt;br&gt;• From infected mother to baby during birth</td>
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<td>TB</td>
<td>• Living with a person with active TB&lt;br&gt;• Residing in a long term care facility or homeless shelter&lt;br&gt;• Correctional facility inmates infection with HIV disease&lt;br&gt;• Certain health conditions such as diabetes and cancer</td>
<td>• Breathing of droplet nuclei from a person with active infection when they cough, laugh, sing, or sneeze</td>
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<tr>
<td>Influenza</td>
<td>• Close contact with an infected person anywhere from 1 day before they exhibit symptoms to 7 days after</td>
<td>• Coughing&lt;br&gt;• Sneezing&lt;br&gt;• Touching contaminated surfaces</td>
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Visit the Newslinks section of the OSAP website often to get infection control updates that will help you respond to patient questions. [http://www.osap.org/issues/newslinks/](http://www.osap.org/issues/newslinks/)

CDC Guidelines available from: [www.cdc.gov/oralhealth/infectioncontrol/index.htm](http://www.cdc.gov/oralhealth/infectioncontrol/index.htm)
Calendar

To help practices stay on track, OSAP provides this calendar listing typical schedules for periodic maintenance, record-keeping, and infection control activities. This schedule is intended only to serve as a guide. Proper practices, procedures, and maintenance schedules can vary according to the kinds of products used, the practice type, and patient volume. Always follow the device or equipment manufacturer’s instructions for maintenance and infection control.

For a monthly dental office calendar you can customize to best meet the needs and schedules in your practice, visit osap.org/calendars/index.htm. (Adobe Acrobat Reader required.)

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1. Historically, infection control precautions have focused the most on which group of diseases?
   A. Airborne  B. Waterborne  C. Bloodborne  D. Saliva-borne

2. In the influenza pandemic of 1918-1919, over _____million people died worldwide.
   A. 5  B. 20  C. 30  D. 50

3. The common drug resistant infection in health care facilities is:
   A. MRSA  B. HIV  C. HCV  D. CMV

4. When vaccines are not available a person’s first line of defense against disease is:
   A. antibiotics  B. their immune system  C. PPE  D. special precautions

5. Cruetzfeldt Jacob disease is caused by:
   A. an abnormal protein  B. a virus  C. bacteria  D. protozoa

6. Which of the following body fluids is not included in Standard Precautions?
   A. blood  B. saliva  C. sweat  D. wound exudates

7. A source that allows a pathogen to survive and multiply is called a:
   A. reservoir  B. mode  C. chain of infection  D. pathogen

8. Recipients of blood or organs prior to 1992 are specifically at risk for which bloodborne disease?
   A. HIV  B. hepatitis B  C. hepatitis C  D. herpes simplex virus

9. A person may be contagious for influenza for ______ prior to exhibiting symptoms.
   A. 1 day  B. 3 days  C. 5 days  D. 7 days

10. Which of the following is an airborne disease?
    A. hepatitis B  B. hepatitis C  C. tuberculosis  D. herpes simplex virus

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Since the year 2000, OSHA has required dental professionals to evaluate and if appropriate, use engineered safety devices. Some offices may be finding it difficult to implement this requirement because they are unsure of what exactly is required and how to go about doing the evaluation. An organized approach, appropriate documentation and a bit of vigilance goes a long way in meeting the requirements.

The first step is to inventory the various sharps used in the office and to identify potential alternatives with sharps protection features that are available in the dental market. Some examples of devices for which there are alternatives with sharps protection include scalpels, IV catheters, dental syringes and medical syringes. A thorough review of dental and medical supply catalogs or a stroll through a large exhibit hall at a state dental convention should help identify items currently available. Purchase small amounts of available devices or request samples from the manufacturer or distributor. Collect the devices and prepare for the evaluation process. Very good template evaluation forms developed specifically for dentistry are available at the CDC website (http://www.cdc.gov/oralhealth/infectioncontrol/forms.htm).

Evaluation is a two-step process that involves the screening of the device outside the patient’s mouth. Once the device passes the screening test, a clinical evaluation is next. Complete the forms from the CDC throughout the evaluation to document your results. If the evaluation is favorable, implement the use of the device in the office. If the evaluation is unfavorable, continue the review of new safety products as they enter the market.

Effective devices will reduce sharps injury, resulting in a safer workplace and reduce the need for expensive medical follow-up needed for exposure incidents.

Dr. Brian Shearer has a Ph.D. in microbiology and was Director of Information and Policy, Council on Scientific Affairs with the American Dental Association. Dr. Shearer was subsequently the Assistant Director of Scientific Communications with Bayer Pharmaceuticals Corporation.

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!