Many infection control issues for dentistry are dynamic -- new, evolving or reemerging each year. A sampling would include volunteer medical missionary work, medical tourism and the increasing presence of computers in clinical areas.

**Medical missionary work**

Many practitioners and students volunteer to participate in outreach programs, traveling to developing countries to provide treatment. However, visiting many areas of the world is not without risk. Food and water can be sources of infection. Diseases, such as malaria, hepatitis A and B, tuberculosis, typhoid, yellow fever and various protozoan infections are endemic in many areas. The Centers for Disease Control and Prevention (CDC) list more than 40 diseases relatable to international travel. Many healthcare facilities have travel clinics that distribute information specific for a given country or area and immunization recommendations. Even the most basic types of medical supplies are often in short supply and treatment areas may be poorly equipped with few trained local practitioners.

Fortunately, OSAP has prepared a 52-page guidebook and CD to help dental practitioners provide better (and safer) humanitarian aid in non-traditional settings. It is the Guide for Safety and Infection Control for Oral Healthcare Missions and is available at www.osap.org/displaycommon.cfm?an=1&subarticlenbr=15

**Hitting the road for dental care**

Falling ill while abroad seems like the worst sort of traveling nightmare. Yet, for growing numbers of travelers, the lure of combining affordable medical care with attractive locations is a major draw for packing a suitcase and boarding a plane. A search on Google for the term "medical tourism" resulted in more than 21,000,000 sites.

Medical tourism or medical travel is the act of traveling to other countries to obtain medical, dental, and surgical care. Travel agencies and the media use the catchall phrase to describe a rapidly growing industry. Leisure aspects may be included on such a trip. Often involved are elective procedures and complex specialized surgeries such as knee/hip replacement, heart surgery, dental treatments and various cosmetic procedures.

Savings can be significant, often more than 75%. Other factors favor medical travel - reasonably priced international flights, acceptable levels of medical expertise, quality of care and much shorter wait times. Medical tourism is particularly attractive in the United States, where an estimated 43 million people are without health insurance and 120 million are without dental coverage.

Inferior medical care would not be worth having at any price. Before traveling outside the United States for dental care, patients should check whether the destination country has national guidelines or standards for dentists. Some questions a patient should ask include:

- What are the qualifications for dentists?
- What are your rights as a consumer?
- Is there a complaint process?
- If you used a travel agency, will they help you if problems occur?

Learning Objectives

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

- describe factors associated with evolving infection control issues.
- identify the reasons why certain diseases emerge or reemerge.
- list the roles dental offices can play in controlling the spread of infectious diseases.

continued on page 2
Emerging Infection Control Issues

continued from front cover

Developing countries do realize that high-quality care is a major source of income. Yet, extensive research in the selection of a treatment site is required.

Of course, the use of proper infection control procedures is essential. Potential patients should evaluate the treatment site upon arrival. The OSAP pamphlet entitled OSAP Traveler’s Guide to Safe Dental Care includes a checklist for safe dental treatment abroad. Check www.osap.org/displaycommon.cfm?an=1&subarticleid=55 for additional information.

Electronic technology in dental clinics

Computers have become ubiquitous in healthcare facilities. Several studies suggest that computers may contribute to cross-transmission. Improperly handled keyboards and mice can become reservoirs for pathogens in patient care areas. Compliance with hand hygiene guidelines is helpful, but hand hygiene practices are often inadequate.

A recent hospital study indicated that microbial contamination was prevalent on 25 computer keyboards used in six clinical areas. Most isolates were normal hand flora. Staphylococci were present on all keyboards, with culturing indicating the presence of drug resistant strains. The authors felt the levels of contamination were high enough to allow transmission of these organisms via the workers’ contaminated hands.

The authors also tested six disinfectant wipes and sterile water on seven laptop computers soiled with known concentrations of three pathogenic bacteria, including drug resistant forms. All the isolates came from a covered keyboard/mouse. Disinfection reduced microbial counts by more than 90% on the surfaces sampled. Over 90% of the bacteria isolated and were present on 4.5% of all microbial colonies comprised 1.5% of all microbial colonies.

Infectant followed by another sampling.

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Infection Control Improvement (IHI)

The IHI estimates that 15 million incidents of medical harm occur in the United States each year - a rate of over 40,000 per day. In 2004, the IHI initiated a nationwide program called The 100,000 Lives Campaign, designed to reduce preventable deaths. Numerous new standards of care emerged. Two emphases were prevention of adverse drug events and ventilator-associated infections.

In 2006, the IHI developed a new two-year campaign - Protecting 5 Million Lives from Harm. It also included reducing non-fatal forms of harm. New interventions included preventing harm from high-alert medications (such as insulin), reducing surgical complications; reducing methicillin-resistant Staphylococcus aureus (MRSA) infections (by implementing scientifically proven infection control practices) and the delivery of more reliable, evidence-based forms of care.

The 5 Million Lives Campaign is the largest improvement initiative undertaken in recent history by the healthcare industry. The changes proposed are bold and the goals are lofty.

Centers for Disease Control and Prevention (CDC)

Emerging diseases can pose infection control challenges. An example is the group of noroviruses, which cause acute gastroenteritis. Noroviruses have been involved with outbreaks of illness on cruise ships and in hospitals.

Noroviruses are highly contagious. Transmission is primarily through fecal-oral routes, by either direct person-to-person spread or contaminated food or water or via droplets coming from vomitus. These viruses are relatively stable in the environment.

In healthcare facilities, transmission can also occur through hand transfer of the virus to the oral mucosa via contact with materials, fomites and viral contaminated environmental surfaces.

Limiting norovirus transmission includes standard and contact precautions, isolation of the affected persons and environmental disinfection. Diluted chlorine bleach is the disinfectant of choice. Thorough and repeated cleaning and disinfection cycles are required. However, extensive use of bleach requires consistent use of personal protective equipment by workers. Bleach fumes also cause adverse responses especially among asthmatics.

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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Putting It All Together

Patient-to-patient transmission of hepatitis B

In April 2002, the New Mexico State Department of Health received notification of a new acute case of symptomatic hepatitis. The patient was a 60-year-old female with none of the traditional risk factors save having oral surgery in October 2001. The state’s hepatitis B registry uncovered a cross-match with a hepatitis B virus (HBV) infected 36-year-old woman seen on the same morning as the other patient.

Officials investigating the possible dental office transmission reviewed employee health records, performed HBV serologic tests on all employees with direct patient contact and conducted an in-office assessment. Fourteen of the 15 employees had completed the HBV vaccination series. No employee had serological evidence of an HBV infection. All staff members worked full-time and were experienced with standard operating techniques. No employee recalled any unusual events on the day in question.

Extractions on both the 36-year-old (source patient) and the 60-year-old (index patient) occurred in the same operatory. The source patient’s surgery lasted an hour, followed by three other patients and finally the index patient. Separation of the two was 161 minutes.

Serological testing indicated that the source patient had a high viral load. Both the source patient and the index patient shared the same HBV genotype (A/serotype adw2). DNA sequencing proved viruses isolated from the two patients were identical. Serological testing on 25 of the 27 patients treated after the source patient revealed that 19 (76%) were immune to HBV. There were no additional index patients.

There were two oral surgeons in the practice. After extensive review, the examiners found no infection control deficiencies. All removable instruments, including handpieces, underwent autoclaving while wrapped. Plastic covered the non-detachable items. The rubber nitrous oxide-oxygen delivery masks were the only patient care item disinfected instead of sterilized. The staff opened all the processed packages, placed them into function groups on surgical trays, added a cover and held them in a clean storage area for a short period before use. Medications came from a non-treatment room with a strict one-way flow of needles.

The reviewers found a modern, clean, well-operated oral surgery clinic. All employees followed Standard Precautions. All uncovered (and most covered) surfaces underwent disinfection between patients with an acceptable product. Treatment of all patients in a given morning included only fresh instruments with no instruments in common. There had been no autoclave problems.

Here was an office that demonstrated a high standard of infection control compliance. Yet, there was proof of patient-to-patient transmission of HBV.

Reviewers considered all the possible modes of transmission and concluded that patient-to-patient transmission of HBV occurred and that such transmission is rare, especially considering that almost 0.5 billion procedures occur in the United States each year.

When situations like this happen, it is a good time to review the procedures used in your office. The following questions could be helpful:

- Do all employees know their serological status for bloodborne pathogens?
- Did all employees receive the HBV vaccination series using the appropriate method and dosage, and have proof of serological protection?
- Will your medical history help detect patients with bloodborne disease?
- Is your sterilizer functioning properly?
- Do you mechanically, chemically and biologically monitor your sterilizer?
- Do you have a system designed to prevent the use of unprocessed instruments?
- Do you change the protective covers placed over clinic contact surfaces after every patient?
- Do you properly disinfect uncovered surfaces after every patient?
- Do you change masks and gloves after each patient?
- Do you perform hand hygiene procedures before placing and after removing gloves?
- Do you change protective gowns immediately if soiled?

Ask OSAP

Q: We cover or disinfect all our clinical contact surfaces. Yet, I am concerned about other surfaces in the office. Do you have any ideas?

A: You may be onto something. Germs are everywhere in the workplace. The most contaminated non-clinical surfaces are phones, desktops, water fountain handles, microwave handles/buttons, computer keyboards/mice, light switches and fax/copy machines. According to Dr. Charles Gerba, a microbiologist at the University of Arizona, the average desk harbors more than 10,000,000 microbes - 400 times more than the average toilet seat. Less than half of workers indicate they clean their desks before eating. According to Gerba - “No one cleans a desktop until they start sticking to it.” Most of the disinfectants you use in the clinic will work on these office surfaces. Cleaning these surfaces daily or even weekly with disinfectant wipes can reduce bacteria levels by 99%, even in the most contaminated areas.

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

A generation ago, experts suggested the threat of infectious diseases would soon become an artifact of history. Today, we know the folly of that position. We remain vulnerable to new and reemerging diseases.

Infectious diseases remain the leading cause of death worldwide and the third leading cause in the United States. Many pathogens are becoming increasingly resistant to standard antimicrobial drugs, making treatment difficult and in some cases impossible.

Infectious diseases are a threat to all persons, regardless of age, gender, lifestyle, ethnic background or socioeconomic status. Infectious diseases no longer have geographic boundaries. Although modern advances, such as antibiotics and vaccines, have conquered some diseases, new ones are constantly emerging (e.g., human immunodeficiency virus and acquired immunodeficiency syndrome [HIV/AIDS], Lyme disease, Hantavirus pulmonary syndrome), whereas others reemerge in drug-resistant forms (e.g., malaria, tuberculosis and bacterial pneumonia).

During the early 1990s, the CDC started to investigate outbreaks of diseases outside the United States, sometimes as part of an international World Health Organization team and sometimes in direct response to a request from an affected nation. Today, the CDC lists 45 diseases considered to be emerging or reemerging in the United States.

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**Bloodborne pathogens:** Include hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV). Exposures occur through needlesticks or cuts from other sharp instruments contaminated with an infected patient’s blood or through contact of the eye, nose, mouth, or skin with a patient’s blood.

**Emerging diseases:** New infectious diseases not previously recognized.

**Genome:** An organism’s entire hereditary information encoded in the DNA (or, for some viruses, RNA).

**Genotype:** The composition of part of an individual’s genome, which contributes to determining a specific trait.

**Index patient:** The first case or patient who is recognized as an indicator of a potential public health problem.

**Noroviruses:** A group of related, single-stranded RNA, non-enveloped viruses that cause acute gastroenteritis in humans; cause around 50% of all gastroenteritis (stomach pain, diarrhea, and vomiting) around the world making it the most important virus associated with this condition.

**Reemerging diseases:** Previously known diseases that now possess enhanced transmissibility and/or pathogenicity, often due to increased drug, chemical or environmental resistance.

**Source patient:** The case or person who was the original source of infection for secondary cases or contact; can sometimes also be the index case.

**Zoonotic diseases:** Any infectious disease that may be transmitted from animals, both wild and domestic, to humans or from humans to animals (the latter is sometimes called reverse zoonosis).

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**Ask OSAP**

**Q:** Several people in the office want to discard some burs and endodontic files after one use. This costs money. Is it necessary?

**A:** First, here is a quote from the 2003 CDC Infection Control in Dentistry Guidelines - Because of the physical construction of certain devices (e.g., burs, endodontic files, and broaches) cleaning can be difficult. In addition, deterioration can occur on the cutting surfaces of some carbide/diamond burs and endodontic files during processing and after repeated processing cycles, leading to potential breakage during patient treatment. These factors, coupled with the knowledge that burs and endodontic instruments exhibit signs of wear during normal use, might make it practical to consider them as single-use devices.

We also wish to share the results of two studies conducted in the United Kingdom. The first study visually examined ten used, cleaned and sterilized endodontic files from each of 25 general practice offices. Most of the files were stainless steel. None of the offices used the files as single-use disposable items. Of the 250 files examined, 75% has some degree of visual contamination. Seven percent tested positive for the presence of blood. Those with blood had greater amounts of adherent materials. Even without magnification, many of the files appeared contaminated. Yet, offices still accepted these files for use.

The second study evaluated endodontic files from 22 general dental practices. Methods used were the same as the first study, but measurement of residual protein replaced blood analyses. Results indicated that 98% of files were visually contaminated. All files demonstrated widely different amounts of residual protein. Once again, cleaning regimens used by offices routinely failed to decontaminate endodontic files.

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

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**Best Practices**


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. Noroviruses can cause:
   a. respiratory infections  b. gastroenteritis  c. dermatitis  d. hepatitis

2. How many dental procedures occur each year in the United States?
   a. 15,000,000  b. 200,000,000  c. 500,000,000  d. 1,000,000,000

3. In the United States, infectious diseases are the:
   a. #1 cause of deaths  b. #2 cause of deaths  c. #3 cause of deaths  d. #4 cause of deaths

4. Which of the following is an example of zoonosis?
   a. tuberculosis  b. Lyme disease  c. norovirus  d. hepatitis B

5. Where would you most commonly find Legionella organisms?
   a. water  b. blood  c. skin  d. food

6. Spread of Cryptosporidium parvum involves:
   a. contaminated ice cream  b. contact with dirty desktops
   c. contaminated ground beef  d. improperly treated drinking water

7. On average, which contains more microorganisms?
   a. desktop surfaces  b. toilet seats

8. You have a cold. You sneeze on me. I get your cold. I am the:
   a. source patient  b. index patient

9. How many incidents of medical harm occur in the United States each year?
   a. 175,000  b. 1,250,000  c. 15,000,000  d. 100,000,000

10. Currently, does the CDC recommend booster injections of healthcare workers successfully vaccinated against HBV?
    a. yes  b. no
It is increasingly well understood by dental professionals that there is an undeniable link between oral and systemic health. Many diseases manifest symptoms in the soft tissues of the mouth before others symptoms arise. For diseases such as diabetes and AIDS, the oral cavity may provide the first hints of a broader systemic disease. In addition to signaling diseases, the oral cavity may act as an indicator of complications of chemotherapy and radiation in patients receiving cancer treatment. Periodontal disease may share genetically determined risk factors with other degenerative diseases such as ulcerative colitis and lupus. The importance of this to the early detection and treatment of illness is perhaps not as broadly understood by the primary healthcare providers. A lack of understanding of the oral/systemic connection could potentially delay diagnosis of new illness in patients, or fail to identify illnesses for which a patient is at risk. Additionally, maintaining oral health in all patients is important to the maintenance of their overall systemic health.

To better understand the level of knowledge of oral healthcare practices among medical providers, we undertook a survey of oncology and critical care nurses. The goal was to measure their understanding of oral hygiene, anatomy and physiology and to explore nursing practices for maintaining the oral health of high-risk patients. We found that the nurses had a good knowledge of oral anatomical landmarks and an educational background to be able to recognize oral diseases and offer preventive care to patients. However, the nurses were not familiar with oral disease processes, the definition of dental plaque or the manifestations of gingivitis. The results indicated a need by nurses for better oral care of critically ill patients. The nurses reported that their institutions did not always adhere to standardized oral care protocols. Needed are better instructional interventions and facility compliance. The opportunity to share this information may arise if your dental office is associated with a hospital, if you are an educator and present information to hospital-based dental workers, or if you are an author and submit oral healthcare articles to medical journals.

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