Mission Trips - First Do No Harm

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CE Credits: 2 hours
Intended Audience: Dentists, Dental Hygienists, Dental Assistants, Dental Students, Dental Hygiene Students, Dental Assistant Students
Date Course Online: 11/20/2012  Last Revision Date: 02/15/2017  Course Expiration Date: 02/14/2020
Online Course: www.dentalcare.com/en-us/professional-education/ce-courses/ce397

Disclaimer: Participants must always be aware of the hazards of using limited knowledge in integrating new techniques or procedures into their practice. Only sound evidence-based dentistry should be used in patient therapy.

Introduction
The dental profession is known to be generous in donating time and talent to help those in need of oral healthcare throughout the United States and globally. It is important for the volunteer team to thoughtfully consider their own health as well as the safety of the people whom they will treat.

The Organization for Safety, Asepsis and Prevention (OSAP) was founded in 1984 and formally incorporated as a non-profit organization in 1986. OSAP membership consists of a unique group of dental educators, consultants, researchers, clinicians, industry representatives, and other interested

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Provider ID# 211886
persons with a collective mission to be the world’s leading advocate for the safe and infection-free delivery of oral healthcare. OSAP supports this commitment to oral healthcare workers and the public through quality education and information dissemination. OSAP has developed a “Guide for Safety and Infection Control for Oral Healthcare Missions.” Based in large part on this Guide, this course provides guidance to help ensure the health and safety of mission participants, their dental patients and the community at large. Please note that the guide is not a comprehensive planning document for all missions and other aspects of each mission will need to be considered. All Appendices referenced in this course are used with permission from OSAP, 2016.

Conflict of Interest Disclosure Statement
• Curt Hamann, MD is the CEO of SmartPractice.
• Charles Palenik, PhD reports no conflicts of interest associated with this course.

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Overview
A dental mission is travel made by a group of oral healthcare professionals to a foreign country or to another area of their own country to perform a special study, project, or simply to provide needed oral hygiene instruction and clinical dentistry. The typical dental mission is approximately one week in duration. However, some missions and missionaries may involve longer commitments of time at more permanent healthcare facilities. Dental missions are often supported by religious, fraternal or professional associations. An estimated two million North Americans participate in a medical/dental mission each year. There are faith-based and non-faith-based missions. Non-faith-based organizations focus solely on the oral healthcare...
of people. Faith-based organizations have a dual purpose – evangelization and healthcare. This course will focus exclusively on the clinical aspects of oral healthcare missions.

Healthcare in developing countries can be quite different in less developed nations than in developed nations. There may be a shortage of trained healthcare professionals. The resources (facilities, supplies, equipment, electricity and even water) available may be limited. Additionally, there are elements of risk associated with participation on a mission trip.

Healthcare missions involving students in training are becoming a common activity. This is often an important component of a school’s outreach and community service programs. The objectives are to:

1. Expose students to diverse patient populations suffering from a broad range of dental diseases which students would be unlikely to encounter in their dental school clinic;
2. Offer students an opportunity to interact with dental clinicians working in a variety of healthcare delivery systems, and
3. Instill empathy and an increased sense of local and worldwide responsibility to help prioritize oral hygiene instruction and meet the dental needs of deserving individuals.

**Learning Objectives**

Upon completion of this course, the dental professional should be able to:

- Describe the reasons/purposes for a mission trip.
- Identify steps in preparing for an oral healthcare mission.
  - Identify and discuss cultural differences.
  - Identify the types and numbers of tasks that can be accomplished and those that cannot.
  - Match personal and local resources with perceived needs.
  - List the routine immunizations necessary, special considerations and steps to prepare for emergencies.
- Design infection prevention strategies used in less than optimal conditions that ensure both patient and practitioner safety and health.
- Develop checklists that support the design, application and review of clinical procedures.
- Create a methodology to debrief returning participants and objectively evaluate the entire mission trip.

**Introduction**

The main purpose of an oral healthcare mission is to deliver oral hygiene instruction and clinical care to areas where it is nonexistent or substandard. Reasons for a shortage of dental care can include insufficient numbers of trained clinicians, armed conflict, famine, societal practices, poverty, a natural disaster or an epidemic.

During oral healthcare missions, as in other settings, patient and dental healthcare safety are key. Furthermore, re-emerging and emerging diseases, together with the global threat of antimicrobial resistance, emphasize the need for vigilance, precautions and infection control. Recent concerns have included drug-resistant tuberculosis, dengue fever, the Ebola virus disease outbreak, and the current outbreaks of Zika virus disease (Zika). While Zika is primarily transmitted to humans by bites from an infected *Aedes* mosquito and typically results in a mild fever of up to several weeks duration, it can be transmitted from an infected pregnant woman to her fetus causing microencephaly. The Zika virus is also present in the semen of an infected male and can be sexually transmitted, and it is present in the blood of infected people for a period of time. Palliative care relieves the symptoms of Zika and plenty of fluids prevents dehydration, however there is no vaccine. Therefore, it is important for dental healthcare workers going on mission trips to take extra precautions if the mission site (or travel) is in an area with a Zika outbreak: clothing should cover the skin (long-sleeved tops and legs covered), and a CDC recommended EPA-registered insect repellent should be conscientiously applied during the mission trip following the directions on the labeling. In addition, clothing and gear can be treated with permethrin, and mosquito nets are recommended for sleeping. Upon returning home, to prevent transmission of the Zika virus sexually active male mission participants should only have protected sex, and all returning participants should take care to avoid mosquito
bites which could transfer Zika to a previously uninfected mosquito and then to another person by this vector.

**Invitation to Come**

Many dental missions are repeat visits. Whether the mission is a repeat or a first time event, there are documents of agreement that must be signed by both parties. Preparation is key to a successful mission. Travel to areas of need often requires securing certain permissions, releases and privileges from government officials, which takes time and attention to detail.

**Local Partners – Cultural and Language Barriers**

Oral healthcare missions require flexibility – “expect the unexpected.” Since most healthcare missions involve volunteers, offers to help and cooperation are expected behaviors that make the mission more successful.

Volunteers must be responsible and respectful guests. It is extremely important to show sensitivity to local cultures including language, traditions, superstitions, beliefs about health as well as religious faith and practice. Culture is like the air we breathe: taken for granted, but impossible to live without.

Political statements are out of order. So are criticisms of local facilities, volunteer and local healthcare professionals, patients and others in the community. Prior to the mission, the group must establish a mechanism through which suggestions/offers/thoughts can be tactfully brought forward.

Offers for social or recreational invitations are a common and important part of a healthcare mission. An effort should be made to engage and graciously accept the hospitality. If a mission attendee chooses not to participate, then the mission’s volunteer coordinator should be informed.

Many healthcare missions attempt to partner a local person (or two) with each visiting volunteer. Partnering leads to increased effectiveness and efficiency, promotes sharing of ideas and thoughts and can help establish professional collegiality as well as personal friendships.

**Identifying Support**

A successful healthcare mission must match projected goals and the associated needs with the resources required (human, physical and financial). It is imperative to describe the mission in detail months before leaving for it. Realistic expectations are then paired with the resources required. Local resources must be determined and a mutual understanding of the mission established. In spite of extensive front-end planning, healthcare missions demand a certain amount of flexibility.

Dental missions can challenge one’s concept of efficiency and effectiveness. Much of what some societies are accustomed to is completely different in the places missions serve. It is probably better to see fewer patients and perform fewer procedures than to overreach and be disappointed with the results. Traveling to, staying in and functioning well within a foreign country can be difficult. Louis Pasteur once said, “Chance favors the prepared mind.”

**Preparing for the Mission**

**Assembling the Volunteer Team – Numbers and Responsibilities**

The number of people on the mission team and their expertise must meld well with the clinical and patient education goals of the mission. It is also important to quantify the number of patients and procedures anticipated. Usually dentists, dental hygienists, dental assistants and clerical workers are needed. Certain specialists may also be required. Integration of local personnel is valuable, and must be intentionally and sensitively discussed and planned. See Appendix A - “Main Checklist for Oral Healthcare Missions,” which provides a primary checklist for the entire mission. In addition, Appendix J - “Oral Care Humanitarian Mission Briefing” helps volunteers organize for the mission.

There must be an on-site local director as well as a volunteer mission coordinator. These two individuals have overall control of the project, including scheduling activities and solving conflicts. Kind and culturally relevant communication is critical to a successful mission, which will require translation for
volunteers who do not speak the host or patient language. Missions must help without enabling. Positive missions help people in need without being patronizing and without causing an increased sense of powerlessness. Cultural differences (and a lack of cultural sensitivity) exacerbate this risk. Visiting volunteers and local personnel must work hard to increase the chances of “helping without hurting.” Carefully listening to the dental priorities articulated by the host dental leaders is an important discipline in optimizing the value of the mission.

Background on Mission Site and Local Cultures
The more that is known in advance about the mission site, the better the chance of success. Obtaining a working understanding of the mission area, even with an effort that has been ongoing, can take months of preparation. Language differences, as well as the standard of care it will be possible to provide, may be challenging.

Learn about the people who live where the team will be serving with the hope of understanding their lives, culture and particular mindset. What factors promote health? What factors negatively affect the health of the local population? How does the local population earn a living? What is their diet? What is the current standard of healthcare? What is the level of oral hygiene? What is the climate and geography? What are the common diseases? Are there any current outbreaks of disease? Learn about any political situations that might be going on. Study the needs of the people. If possible, speak with someone who is from the area of the mission site as well as to people who have visited it. Knowledge about the local population and location will help bridge the gap between just being there to serve people dentally and potentially affecting positive changes for the future. See Appendix D - “Patient Medical Review Form.”

Local Regulations Concerning the Provision of Dentistry
Care provided by oral health care missions must meet the legal requirements, dental standards and practice guidelines of the host country. Participants in dental missions should be familiar and, at a minimum, comply with the standards of the location where care is provided. It is important to identify what credentials and background are needed for volunteers to legally provide dental care in the location of the mission.

Practicing as a healthcare profession in a foreign country without a license may be illegal. Sometimes a temporary certificate (or registration) to practice is required. Healthcare professionals must comply very carefully with licensure requirements of host nations, who rarely offer exemption simply because the volunteers may be providing free dental care for those in need. Serving under the authority of a licensed national practitioner may be sufficient, but healthcare professionals must be diligent to verify the regulations. Complying with national licensure requirements not only prevents legal complications, but is also a strong symbol of respect for the host nation and the ethical practice of healthcare professions.

How would one obtain the appropriate licenses in the nation in which the volunteer mission is planned? Begin by contacting local national partners. They are usually the people with the greatest interest in assisting and have the greatest insight into negotiating the requirements and procedures for proper licensure with relevant authorities. Such information must be completed in advance and must involve the major local contacts.

Determining Local Needs
Nature and Number of Tasks that can be Performed
In addition to ensuring compliance with regional dental standards, the mission coordinator must estimate the number of anticipated patients. This number and an estimate of types of treatment to be provided affect the number and types of instruments, equipment, personal protective barriers and related materials required. Arrangements to bring the necessary supplies must be taken into account. See Appendix B - “Instrument/Workload Calculation” to help calculate the number of instruments and amounts of materials needed.

Tasks that Cannot be Performed
Every mission has limitations. It is safe to assume that efficiency on an oral health mission will be less than the typical clinical environment where
the volunteers usually practice. The types of oral hygiene instruction, diagnoses and treatment that can be provided must be specifically identified. Factors such as available resources, the time required to process instruments, the capacity per cycle of cleaning and sterilization equipment, and the number of staff available for activities, such as instrument recycling, influences greatly the amount and type of care that can be provided.

Establishing Local Contacts – Advanced Arrangements
“Luck is what happens when preparation meets opportunity.”

Ensure that advanced arrangements have been made for arrival and setup on site. See Appendix A - “Main Checklist for Oral Healthcare Missions” and Appendix C - “Site Evaluation Summary.” (Used with permission from the Organization for Safety, Asepsis and Prevention, OSAP, 2016.)

- Have a letter of invitation or support from local sponsors,
- Make a site visit, if possible.
- Obtain permits to practice, if necessary.
- Identify available resources (e.g., electricity, potable water, food, accommodations, etc.).
- Identify the available local medical emergency services.
- Review local waste disposal resources.
- Identify local sanitary facilities.
- Identify and plan for the primary needs of the local population.
- Respect the prioritization of needs by the local dental professional sponsors.

Traveling to the Mission Site

Visas
Have a current passport and visa, if needed. The US Department of State - Visas offers valuable advice concerning foreign travel. The website also provides information on every country in the world (Country Specific Information), including information on the location of the US Embassy and any consular offices, whether a visa is needed, crime and security information, health and medical conditions, drug penalties and localized hot spots. The US Department of State also offers a voluntary program through which travelers can register their travel plans. The Smart Traveler Enrollment Program (STEP) is intended to increase the likelihood of US citizens receiving assistance from the US government should it be needed while traveling internationally. The registration is available online at: Smart Traveler Enrollment Program.

Length of Stay
Most dental missions are short. The duration is often tied to the availability of resources, including the time commitment made by the volunteers away from their dental practices.

Transportation
Transportation requirements become easier to establish once a site has been selected and the number of people traveling is known. However, other criteria can have an impact. To a great extent, the mode of transportation and type of location determines the materials and equipment that can be brought along. This includes both air and ground transportation. Airlines restrict the amount of baggage that one person can bring without additional expense. The availability of equipment supplies can impact what tasks can be accomplished. Modes of transportation also affect the types of items that can be brought. For one’s first mission or for the first mission to a specific location or region - think small. The easier a site is to reach, the more one can usually bring. With experience, more challenging journeys can be contemplated.

Packing
Personal items should match the demands of the location and the length of the mission. Problems can occur when bringing dental instruments and equipment. Sharp items must be packed with checked luggage and cannot be placed in carry-on luggage.

Local Resources Available

Accommodations
Find out where the dental care items will be stored and what supplies will be available. What will be provided and what will have to be transported? Ask about laundry service availability. This will influence the amount of clothing to pack. If mosquitoes are a known problem, it is prudent to take insect repellent
and mosquito nets with you and to wear clothing that covers as much skin as possible. In areas with a Zika outbreak, the CDC recommends using an EPA-registered insect repellent specifically containing DEET, picaridin, IR3535, oil of lemon eucalyptus, or para-menthane-diol; the directions on the labeling should be followed.

**Food, Water and Supplies**
Assure that facilities are available for safe food storage, preparation, cooking and refrigeration. Plan meals accordingly. Assure the availability of potable water and, if necessary, take filters and tablets with you to treat water.

Gastrointestinal infections are the most frequent cause of illness on missions. The Centers for Disease Control and Prevention (CDC) does not currently recommend prophylactic antibiotics to prevent travelers’ diarrhea for most patients. In addition, prophylactic antibiotics do not offer any protection against nonbacterial pathogens. The primary nonmicrobial agent studied as a prophylactic against TD is bismuth subsalicylate (BSS), the active ingredient in Pepto-Bismol. Before taking Pepto-Bismol check the contraindications on the labeling. Taking over-the-counter medicines for gastric distress and diarrhea (loperamide) may be helpful. A single dose of a fluoroquinolone such as ciprofloxacin or levofloxacin is recommended for the empiric treatment of bacterial diarrhea (CDC/Yellow Book/Travelers’ Diarrhea). In areas where antimicrobial resistance to fluoroquinolones is increasing, an alternative is azithromycin. Remember to replenish fluids and electrolytes lost during TD. Many larger healthcare facilities have travel clinics that offer advice.

**Team Preparation – Safety and Health**
Before leaving, all mission team members should visit their primary physician and dentist to ensure all are in good health and require no special medical management. See Appendix J - “Oral Care Humanitarian Mission Briefing.”

**Medical Issues – Prescription and Non-prescription Items**
Team members should inform their physician or travel medicine professional approximately four to six weeks before the trip that they will be traveling to an area that may have limited resources and ask about health advisories for the area. Additional medication, such as antibiotics (e.g., ciprofloxacin) and antidiarrheal medications may be recommended. If traveling to an area of the world with malaria, prophylaxis should be considered. The recommendation for prophylaxis varies depending on the location, it is important to seek advice and recommendations from a medical healthcare professional.

**Immunizations**
The CDC publishes the Yellow Book every two years, as a reference for those who advise international travelers about health risks. The Yellow Book is written primarily for health professionals, although others will find it useful. Online access is available at: CDC - Yellow Book Homepage.

Most vaccines take time to become effective following inoculation and some vaccines must be given in a series over a period of days or sometimes weeks. If it is less than four weeks before departure, the team member(s) should still visit their physician(s), as they would still benefit from shots or medications and other information about illness and injury prevention while traveling.

CDC divides vaccines for travel into three categories: routine, recommended, and required.

**Routine Vaccinations**
Ensure that team members and their families are up-to-date on routine vaccinations. These vaccines are necessary for protection from diseases that are still common in many parts of the world even though they rarely occur in the United States. The CDC has a site: “Adult Immunization Schedule - Details for Health Care Professionals”, which has a printable schedule feature.

**Recommended Vaccinations**
These vaccines are recommended to protect travelers from illnesses present in other parts of the world and to prevent the importation of infectious diseases across international borders. Which vaccinations are required depends on a number of factors including destination, the season of the year, and a team member’s age, health status and previous immunizations. Another excellent resource is the CDC’s “Destinations” page.
**Required Vaccinations**
The only vaccine required by International Health Regulations is the yellow fever vaccination prior to travel to certain countries in sub-Saharan Africa and tropical South America.

**Volunteer Health and Safety Coordinator**
Copy and complete a Worker Health Information Form (see Appendix E - "Worker Health Information Form") before leaving on a mission. One person on the team should be assigned the primary responsibility for overseeing the medical needs of the team members, including maintaining the confidential medical history forms for each member. Keep health records in a safe location and restrict them on a need-to-know basis.

Update individual health records at least annually to ensure that they reflect the current health status of each team member.

**Preparing for Emergencies, Including Exposure and First Aid**
In addition to the medical history, each oral health mission volunteer should complete an Emergency Medical Release form (Appendix F - “Emergency Medical Release Form”), authorizing by signature medical treatment by emergency personnel, a physician, or a medical treatment facility in the event that permission for treatment cannot be provided or obtained in a timely manner.

Before leaving on the trip, prepare for the possibility that someone may become seriously ill and require a level of care beyond the capacity of the local facilities. Make provision for a rapid evacuation. Often, such services are not covered by individuals’ medical insurance plans. Encourage all team members to consult with their insurance provider and purchase additional travel insurance that includes emergency medical evacuation, if needed. Be sure several team members know the emergency plan and list appropriate telephone numbers in several places and with different people.

A standard first aid kit should be purchased or assembled for use by volunteers who have headaches, allergies, cold symptoms, diarrhea or who sustain simple injuries. A first aid kit should include the following:

- band aids, gauze, ace bandage, adhesive cloth tape
- instant cold and hot compresses
- antibiotic ointment, topical steroid, eye drops
- antihistamine, diphenhydramine (e.g., Benadryl), non-steroidal anti-inflammatory drug (NSAIDs), dimenhydrinate (e.g., Dramamine)
- tweezers
- loperamide (e.g., Imodium)
- Ciprofloxacin with physician prescription and/or an alternative antibiotic

Prepare emergency kits and keep them on hand in treatment areas. The ADA Council on Scientific Affairs recommends seven core emergency kit items including:

- oxygen
- glucose
- diphenhydramine
- nitroglycerine
- albuterol
- epinephrine
- aspirin

An expanded emergency kit when providing dental care in remote areas should include additional supplies to treat medical complications, including:

- pocket masks with one-way valves for cardiopulmonary resuscitation (CPR)
- portable external defibrillator (AED)
- diazepam (e.g., Valium)
- versed
- glucagon
- atropine
- xylocaine
- hydrocortisone
- morphine
- naloxone
- flumazenil
- various syringes to administer these medications in appropriate doses

In addition to emergency and first aid kits, be prepared to manage occupational exposures to blood and body fluids. Post-exposure antiretroviral prophylaxis (PEP) must be administered within 72 hours of exposure to bloodborne pathogens and continued for an additional four weeks to be effective. Necessary post-exposure supplies include:
• Hepatitis B immune globulin (HBIG), which is administered to directly neutralize the hepatitis B virus (HBV) following exposure.
• Vaccine against HBV.
• Rapid OTC oral tests for HIV antibodies.
• Antiretroviral regimens of two or three agents from different classes need to be administered depending on the type of exposure. The types of exposures, classes of antiretroviral drugs, and dosing regimens, as well as drug interactions and potential side effects are well described by the CDC at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5409a1.htm#tab1

Make sure that all team members have discussed the risks and side effects of post-exposure treatment with a qualified healthcare professional before leaving for the mission.

Advanced Volunteer Training
Before departing, ensure that team members are prepared to handle injuries and emergencies.
• Cardiopulmonary resuscitation (CPR) – trained and certified volunteers
• Assign responsibility for the first aid kit to a volunteer trained in first aid, ideally someone who is Emergency Medical Technician (EMT) certified.
• If an Advanced Cardiovascular Life Support (ACLS) certified volunteer is participating, he/she should be given responsibility for the emergency kit and its use.

Local Safety Issues
When traveling in unfamiliar locations, personal safety is very important. Understanding local culture norms, political situations, crime statistics and recent history of riots or terrorism is essential. Specific information regarding issues of personal safety when traveling internationally is available from the US Department of State (Current Travel Warnings). All team members should be aware of such information.

Performing the Mission
Infection Prevention Basics
In dentistry, microorganisms and diseases may be transmitted in four ways:
• Direct contact with microorganisms from an infected person.
• Indirect contact with contaminated objects, such as instruments, equipment handles, or surfaces.
• Droplet infection from sprays or spatter containing microorganisms, which travel a short distance before settling.
• Airborne routes involve aerosols (droplets), which are very small and can remain suspended in the air and travel further before settling.

For a disease to be transmitted, a number of conditions must be present. This “chain of infection” includes:
• A pathogen in sufficient numbers and of sufficient virulence to cause disease.
• A place for the pathogen to reside and multiply (a “reservoir”).
• A way for the pathogen to leave its reservoir and reach a new host (the mode of transmission), such as through dental treatment.
• A portal of entry through which the microorganisms can enter a new host, (e.g., needlestick/sharps injury or contact with mucosa or nonintact skin).
• A susceptible host.

Infection control strategies interrupt this cycle, thus preventing disease transmission.

Infection Prevention Planning
Carefully establishing, planning for, carrying out and assessing the mission's infection prevention protocol will help ensure that patients and team members remain safe.

Prepare before leaving and assess upon return. Use Appendix A - “Main Checklist for Oral Healthcare Missions” and Appendix K - “After-Action Mission Report Template” as a basis for planning the team's infection prevention protocol and for assessing its effectiveness at the end of the mission trip. Such follow-up provides valuable information to help you improve the process on future trips.

Setting out the site. Working in a nontraditional setting presents its own set of challenges; making the area as comfortable and safe as possible helps the team stay focused and protective. Patient positioning, adequate
lighting, access to supplies, freedom from excessive dust, insects and noise and other factors should be considered in selecting the set-up for patient treatment.

**Basic set-up.** First, consider where the team can best define the operating area, particularly the exact position in which patients' heads should be with regard to natural or artificial light. Arrange everything else around this position.

The treatment area must have controlled access. It is undesirable and potentially unsafe to allow onlookers to be present.

Next, determine the traffic flow to and from the operating area to ensure that those who have been treated do not exit through a crowd of waiting patients.

Identify a location offering a place with a suitable writing surface where patients can register, provide a short medical history, and have vital signs recorded. Position this area away from others, so conversations cannot be overheard.

Organize safe, adequate instrument and supply storage to protect these valuable items from contamination, accidental loss and theft. They also need to be conveniently placed so that when stocks in the operating area are low, replenishments are easily accessible.

**Instrument storage.** Protect stored instruments from moisture or contact with a contaminated object. Keep wrapped sterile instruments in their packaging until they are ready for use. Store unwrapped instruments in a covered container that is clearly marked to indicate that the instruments have been sterilized or high-level disinfected. Ensure that contaminated instruments are never stored in the same manner as those that are ready for use.

**Treatment area.** The operating area in many mission situations bears little resemblance to a modern dental office. Sites are usually informal and may not have the same protection from the elements that the team is used to. Whenever possible, locate a building such as a community hall or church that allows the use of indoor space for treating patients.

First clean the floor and remove any obstacles that might cause operators or patients to trip. Sweep up obvious dust. Clean all flat surfaces,
particularly those that will come into contact with instruments or devices that will be used intraorally. If possible, cover surfaces with surgical drapes or other clean material that can be changed between patients.

Clearly establish the boundaries between the areas intended for “clean” items (such as supplies, sterilized instruments and dental materials) and the area designated for “dirty” items that have been contaminated through contact with blood or saliva.

**Instrument processing area.** Instrument processing requires planning to help ensure that instruments are safely moved from the location of use through cleaning, sterilization, and storage. Whenever possible, set up a specific area for instrument processing that clearly separates contaminated items from those that have been processed for reuse with patients. When processing sharp instruments, heavy-duty puncture- and chemical-resistant gloves should be worn. Instruments should be cleaned individually rather than by the handful, which reduces the risk of glove puncture and cross-contamination. A directional flow that allows instruments to sequentially move from

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**Figure 2.** The Principles of Infection Control...in Action.

<table>
<thead>
<tr>
<th>Take action to stay healthy</th>
<th>Limit the spread of contamination</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Get immunized</td>
<td>• Set up the operating field before starting treatment; unit-dose supplies</td>
</tr>
<tr>
<td>• Report occupational injuries and exposures immediately</td>
<td>• Establish “clean” and “dirty” areas for instrument processing</td>
</tr>
<tr>
<td>• Follow the advice of the medical care provider evaluating your occupational exposure</td>
<td>• Cover (barrier protect) surfaces that may become contaminated</td>
</tr>
<tr>
<td>• Wash your hands often</td>
<td>• Minimize splashes and spatter</td>
</tr>
<tr>
<td>• Use alcohol-based handrubbs if hands are not soiled and consider this if the water supply is suspect and may be contaminated</td>
<td>• Properly dispose of all waste</td>
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**Avoid contactin blood / body fluids**
- Wear single-use, disposable gloves, protective clothing, and face and eye protection
- Handle sharps with care
- Use safety devices as appropriate
- Water heavy-duty utility gloves to protect hands during cleaning of sharp instruments

**Make objects safe for use**
- Know the different decontamination processes
- Read chemical germicide labels
- Monitor processes to make sure they’re working as they should

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**Figure 3.** Flow Process for Instrument Management.
receiving in the “dirty” area through cleaning, packaging, sterilization, to the “clean” area and storage is ideal.

**Standard Precautions**
The cornerstone of infection prevention is the use of **Standard Precautions**, which considers all body fluids (except sweat), from each and every patient to be potentially infectious. Use infection prevention precautions to protect workers from exposure to blood, all other body fluids (except sweat and including saliva) and other potentially infectious materials (OPIM). Standard Precautions also prevent indirect transmission from patient-to-patient. Finally, follow the precautions to prevent transmission from healthcare workers to patients.

Careful hand hygiene, use of personal barriers (personal protective equipment), and safe handling and disposal of sharps can protect each member of the team and the patients.

**Hand hygiene.** Hand hygiene is the single most important infection prevention activity in healthcare. Team members must always perform hand hygiene before gloving and after gloves are removed. Where the local water quality is questionable, one should use an alcohol-based hand sanitizer on hands that are not visibly soiled. Although these products are excellent antimicrobials, they are very poor cleaners and are only effective on hands that are free of debris. If hands are visibly soiled, clean them first with previously boiled water or a pre-moistened towelette that contains a cleaning agent. All team members should keep a supply of alcohol-based hand sanitizers for clinical and personal use.

**Personal barriers.** During dental procedures, use personal protective equipment – surgical masks and eye protection, gloves, and clinical gowns - to protect workers’ skin, clothing, and mucous membranes from contact with patients’ oral fluids and other potentially infectious materials. Determine the degree of barrier protection needed by assessing the types of procedures that each team member performs.

**Gloves.** Wear single-use disposable gloves throughout patient treatment. If oral surgery is to be performed, use single-use disposable sterile surgeon’s gloves. When decontaminating instruments, always use heavy-duty puncture-resistant gloves to help avoid puncture injuries when handling contaminated sharp instruments. Change gloves between patients and if punctured/torn. Hands are the primary point of contact from worker to patient, so the risk of cross-contamination is considered high.

**Gowns.** Wear gowns when performing procedures that may produce spray or droplets from the patient’s mouth. Regular clothes are not an appropriate barrier for clinical care. Instead, wear scrubs or other easily laundered clothing.

Select personal protective equipment garments that protect workers’ skin and street clothes. A variety of gown and jacket styles are available. In hotter climates and locations where laundry facilities are not readily available, consider using lightweight paper disposable gowns. Gowns have not been implicated in disease transmission, so it is appropriate to use one gown for multiple patient contacts. Discard the gown when it becomes soiled or overtly contaminated.

**Masks and protective eyewear.** Wear masks and eye protection to protect the mucous membranes of the eyes, nose, and mouth during procedures that may generate spray or droplet contamination from the patient’s oral fluids. The risk of bloodborne disease transmission from a mucous membrane exposure to infected body fluids is lower than the risk from percutaneous exposures, but mucous membrane exposures have resulted in transmission of HIV, HBV, and hepatitis C virus (HCV) to healthcare workers.

Select eye protection based on the type of procedures and devices being used. If spray or spatter is anticipated (such as through the use of air-driven handpieces), wear eyewear with side shields for the best protection.

Avoid touching masks and eyewear during dental procedures, and ideally, masks should be changed between patients.

**Exposure Prevention Plan**
Many needlesticks and other cuts can be prevented by using safer techniques (for example, using needle re-cappers instead of replacing needle caps by hand), disposing of
used needles in appropriate sharps disposal containers, and using safer devices. Exposures to the eyes, nose, mouth, or skin may be prevented by using appropriate barriers (gloves, eye and face protection, and gowns) when there is a risk of exposure to bloodborne pathogens (e.g., through contact with blood or a blood/saliva mix).

Always handle used sharps carefully, and discard disposable sharps (such as blades, needles and broken carpules) in a rigid sharps container to prevent accidental puncture injury. In addition to the precautions previously discussed, some work practices can help prevent exposure to potentially infectious body fluids. These work practices include:

- Using a mirror or retractor instead of fingers to retract soft tissue.
- Removing dental burs from the handpiece before replacing the instrument on the cart.
- Maintaining a container for used sharps in the treatment area to allow disposal of needles, blades, and other sharps immediately after use.
- Announcing instrument passes and carefully transferring instruments between operator and assistant with the blunt end towards the person receiving the instrument.
- Minimizing spatter by using rubber dam and high-velocity evacuation (if available).
- Using safety devices such as self-sheathing needles, retractable scalpels, and needle holders.

Carefully handle sharp instruments during instrument reprocessing. Despite infection prevention precautions, exposures to bloodborne pathogens may occur, particularly when working in unfamiliar mission conditions. Make sure that all team members have documentation showing they have received the HBV vaccine series.

Designate a team member familiar with post-exposure protocols to receive reports of any worker potentially exposed to bloodborne pathogens and initiate appropriate actions. All team members should be trained in the importance of reporting exposures immediately so that decisions about treatments can be made quickly. If post-exposure drugs are indicated, the recipient should be monitored for side effects by someone qualified to make treatment decisions.

**Post-exposure and Other Emergency Procedures**

Immediately report any exposure to blood to the team member responsible for managing exposures. Prompt reporting is essential. If post-exposure treatment is recommended, it should be started as soon as possible (ideally within 72 hours).

**When an exposure occurs:**

- Provide immediate care to the exposure site.
- Thoroughly wash puncture wounds/cuts with soap and water.
- Flush mucous membranes with a sterile solution of water or saline. If sterile solutions are not available, use clean potable water.

No data have demonstrated that using antiseptics or squeezing a wound reduces the risk of transmission of a bloodborne pathogen. Using a caustic agent such as bleach is not recommended.

Review health information with the source patient and if possible, test the patient for HIV. Rapid HIV tests (such as OraSure's ADVANCE® Rapid HIV-1/2 Antibody Test) are available delivering in minutes, rather than days, to determine the need for post-exposure prophylaxis (PEP). Part of the trip planning process should be ensuring that at least one member of the team is familiar with exposure incident recommendations and the PEP medications currently recommended for exposure incidents are available.

Immediately upon returning from the mission, any team member who sustained a blood exposure should consult with a qualified healthcare professional for further follow-up. Follow current public health guidelines for post-exposure management as outlined in Appendix G - “Treatment for Exposures.”

**Sterilization - Instrument Reprocessing**

Three types of portable heat sterilizers are available: steam, dry heat and chemical-vapor sterilization. Each has its advantages and disadvantages. Overall, the steam autoclave is preferred because it is versatile, reliable, and does not require special solutions. Dry
heat sterilization may be used, but its high temperatures can damage some equipment (such as plastics and handpieces). Chemical-vapor sterilization requires that a chemical product be used in conjunction with the sterilizer, therefore also requiring safe disposal of flammable liquid.

If the team is returning to an area on a regular basis, with access to electricity, and are able to safely leave equipment behind, a heat sterilizer that can remain at the site is the preferred means for processing instruments.

**Alternative Methods for Heat Sterilization**
In an emergency situation and only as a last resort, if a commercial sterilizer is not available, a pressure cooker could be used if a consistent heat source (such as a gas burner) is available. Only if the pressure cooker can reach and sustain a 250°F (121°C) temperature at 15 pounds (1.03421 bars) of pressure for 30 minutes may it be used.

To use a pressure cooker to sterilize instruments:
- Choose a pressure cooker of sufficient size to hold the instruments to be sterilized.
- To keep the instruments raised out of the water, place a metal rack (or the rack that comes with the pressure cooker) on empty tin cans to elevate.
- Place water in the bottom of the pressure cooker, following manufacturer's instructions for the amount of water needed for a 30-minute boil.
- For proper sterilization: boil 30 minutes from the time the weight on top of the pressure cooker begins bouncing to let off steam. After 30 minutes, turn off the heat and let the instruments cool. The inside of the pressure cooker remains sterile until it is opened.
- Monitor the cooker once it begins to emit steam. If the steam stops, turn off the heat and permit the cooker to cool down before touching it.
- Do not overload the pressure cooker with instruments, and do not interrupt the pressure cooker during the required amount of time.

**High-level Disinfection**
When heat sterilization is not possible, high-level disinfection (HLD) may be an option, depending on the nature of the device or instrument. Although many products are cleared by the US Food and Drug Administration (FDA) for use as HLDs, some contain chemicals that present health and/or environmental hazards, particularly in areas where engineering controls and hazardous waste disposal services are unavailable. Avoid using HLD products that contain glutaraldehyde, a sensitizing chemical that also presents issues of environmental contamination with inappropriate disposal. HLDs are available that contain 7.5% hydrogen peroxide and are safe with use without these hazards. Appendix I - “Sterilization and High-Level Disinfection” provides a summary of sterilization

<table>
<thead>
<tr>
<th>Category</th>
<th>Definition</th>
<th>Process by</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical</td>
<td>Penetrate soft tissue or bone.</td>
<td>Sterilization</td>
<td>Surgical instruments, periodontal scalers, surgical dental burs.</td>
</tr>
<tr>
<td>Semi-Critical</td>
<td>Contact mucous membranes or non-intact skin.</td>
<td>Sterilization for heat-resistant and handpieces.</td>
<td>Dental mouth mirrors, amalgam condensers, dental handpieces.</td>
</tr>
<tr>
<td>Non-Critical</td>
<td>Contact only intact skin.</td>
<td>Low-to intermediate-level disinfection.</td>
<td>X-ray head/cone, blood-pressure cuff.</td>
</tr>
</tbody>
</table>
and high-level disinfection methods. Of course, whenever possible, choose heat sterilization over chemical disinfection/sterilization.

Although chemical HLDs require no electricity, hauling heavy containers of chemicals still poses a challenge to the traveling oral healthcare worker. Using concentrate and diluting with water that has been brought to and maintained at a rolling boil and cooled before using is one option.

High-speed handpieces are semi-critical items that cannot be boiled or immersed for HLD. If sterilization facilities are not available, avoid performing procedures that require the use of a high-speed handpiece.

If HLD as a minimum standard for processing instruments is not feasible, do not use critical or semi-critical instruments unless pre-sterilized sets can be provided for each patient or single-use disposable instruments are available.

**Storage of Instruments and Materials**
Create an instrument storage system that protects instruments from moisture and contact with contaminated objects. Clearly mark all storage containers to differentiate between instruments that have been sterilized or high-level disinfected and those that are contaminated and waiting to be processed.

Other material must be stored such that they avoid microbial contamination. Avoiding contact with all liquids is the best procedure.

**Environmental Asepsis**
The process of cleaning and disinfecting healthcare facilities is of the utmost importance to help ensure patient safety and prevent the spread of healthcare-associated infections.

Many pathogenic microorganisms can survive for extended periods of time from – days to weeks to months in the clinical environment. Both patients and practitioners can be infected through contact with contaminated environmental surfaces.

**Disinfection** is the destruction of pathogenic and other species of microorganisms by physical or chemical means. Disinfection is less lethal than sterilization, because it can destroy the majority of recognized pathogenic microorganisms, but not all microbial forms (e.g., bacterial spores). Disinfection does not ensure the degree of safety associated with sterilization processes.

The disinfection process involves one or two steps. For two steps, cleaning is performed first, followed by the application of an appropriate disinfectant. It’s desirable to use a cleaner/disinfectant product that contains a detergent (surfactant) to first clean the surface plus chemical agents that are disinfectants and have broad and rapid antimicrobial activity. This saves having to take 2 separate products with you (i.e., a cleaner and a separate disinfectant). In recent years, spray type surface disinfectants have been supplemented by the use of disinfectant-containing wipes. These disinfectant wipes may be easier to transport than liquid disinfectants and disposable paper towels. A one-step process can be performed if the surface is not soiled or only lightly soiled – provided the product being used is both a cleaner and a disinfectant.

There are three basic types or levels of disinfectants used in dentistry:

1. **High-level disinfection** – disinfection process that inactivates vegetative bacteria, mycobacteria, fungi, and viruses, but not necessarily high numbers of bacterial spores. FDA further defines a high-level disinfectant as a liquid sterilant used for a shorter contact time.

2. **Intermediate-level disinfectant** – liquid chemical germicide registered with the US Environmental Protection Agency (EPA) as a hospital disinfectant with a label claim of being tuberculocidal (TB kill time will be noted on the label). Such agents destroy vegetative bacteria and the majority of fungi and viruses and inactivates *Mycobacterium bovis*, but are not necessarily capable of killing bacterial spores. Intermediate-level disinfectants are used on noncritical surfaces with visible blood.

3. **Low-level disinfectant** – liquid chemical germicide registered with EPA as a hospital disinfectant. The US Occupational Safety and Health Administration (OSHA) requires low-level hospital disinfectants have a label claim
for potency against HIV and HBV if used for disinfecting clinical contact surfaces. These can be used on noncritical surfaces only in the absence of visible blood.

The choice of specific cleaning and disinfecting agents is guided by product label claims and instructions and government regulations. Realistic use of liquid chemical germicides depends on consideration of multiple factors, including the degree of microbial killing required; the nature and composition of the surface, item, or device to be treated; and the cost, safety and ease of use of the available agents. In the case of intermediate- and low-level disinfectants used for clinical contact surfaces, choosing to use only an intermediate-level disinfectant addresses infection control requirements whether or not visible blood is present. In contrast, if a low-level disinfectant is used when no visible blood is present this means that the mission must also carry and stock an intermediate-level disinfectant for the situation where the surface has visible blood on it. To reduce product requirements, using only an intermediate-level disinfectant makes sense.

In some cases, protective covers, such as plastic, sheets, tubes or bags can be used as a barrier between surfaces and patient body fluids instead of having to perform cleaning and disinfection after treating each patient. A combination of disinfection and protective covers can be effective and involves professional judgment. If covers are used, they must be removed, discarded and replaced between each patient. If they were damaged during use or removal, the underlying surface must be cleaned and disinfected before placing fresh barrier and treating the next patient.

**Infectious Waste Management**

Waste management is an important aspect of planning and carrying out oral healthcare missions. In areas with few resources for waste disposal, one must have an alternate plan to avoid contributing to the pollution of land and water. It also is important to avoid exposing the local population to waste that contains sharp contaminated items or other materials that may be capable of releasing blood or saliva when handled.

**Waste bags and bins.** Keep waste bags and bins readily available in all areas. Keep one container near the patient chair for gauze and other debris that may be placed in the general trash. At the end of the day, place smaller waste bags in large, heavy-duty plastic bags for disposal. Place sharps containers in the treatment area and the instrument recycling area. Other regulated medical waste must be kept in appropriate containers separate from the general trash and disposed of accordingly (see below).

**Sharps.** Keep puncture-proof containers labeled with the word “biohazard” in all treatment areas. Use these containers to dispose of sharp items (such as used needles, broken anesthetic carpules, and contaminated scalpel blades and sutures) immediately after use.

Proper disposal of waste generated in the clinic depends on the type of materials to be discarded.

**Regular waste.** Much of the waste generated during clinic activities falls into the category of “regular waste.” Items such as gloves, paper towels, gauze, packaging and other materials necessary to conduct patient treatment need to be discarded appropriately. Determine how the locale manages regular waste and make arrangements to have clinic waste removed, incinerated, or otherwise disposed of along with that of the local households.

**Medical/biohazardous waste.** Dispose of all biohazardous material in accordance with local laws. If there are no local laws, incinerate all burnable biohazard waste and bury the ash. Adding an accelerant (such as kerosene) to the waste pile before lighting helps ensure that all waste is thoroughly destroyed. Never add accelerant once the waste has been lit.

If moisture or local restrictions prevent medical waste from being burned, bury it. Choose a site downhill from any wells, free of standing water, and away from flood zones and agricultural areas. Dig a pit large enough to contain all the medical waste generated. Before leaving the mission, seal the waste pit with concrete.

**Sharps.** If possible, find a local medical-waste disposal service. If no such service is available, fill
sharps containers with a solidifier (e.g., cement) and deeply bury them in a waste disposal area away from play areas, animal grazing areas, and water before leaving the location.

**Hazardous chemical waste.** Because disposal of hazardous chemicals is difficult in most locations, avoid bringing these items with you.

If proper transport, handling, and disposal are possible, refer to the chart in Appendix I - “Sterilization and High-Level Disinfection” to determine which product or process is best suited to the available resources and location. Choose a product that is safe for disposal in land, is not adversely affected by extreme temperatures, has minimal health hazards, can be transported in sufficient amounts to serve the mission's needs, and has minimal environmental hazards. Chemical products have limited acceptability in many remote locations where proper disposal and control simply are not possible. As such, consider alternatives to be the primary choice, rather than a compromise.

**Returning Home**
It is hoped that with prior proper preparation, diligent attention to infection prevention throughout the mission and a commitment to the patients and community served, the mission will be a success. The team should take time after the mission to evaluate lessons learned including the challenges and successes encountered during all phases of the mission, accommodations, logistics, healthcare delivery, equipment, supplies and transportation. Also at the end of the trip, assess the health of the team and ensure that patient follow-up and any necessary precautions are completed as necessary. The information gleaned from this analysis can help ensure that the mission is a success and to implement any necessary changes for future mission trips.

**Follow-up for Team Members**
A daily log can serve as a helpful reminder of incidents that may have affected team members' health. If any such incidents occurred, appropriate follow-up may be indicated, such as a physician visit. Remember: team members who had taken malaria prophylaxis need to continue the medication as prescribed by their healthcare professional.

**Patient Follow-up**
The team may need to follow-up with the local mission director on specific patients who have been treated either to ensure that they have been able to continue their medication or have managed to obtain any consultation that was recommended. Keeping in touch also can help people at the site remember instructions. It can be a continuing support for health workers in isolated communities and provide them with a resource for assistance and information in the future.
Appendix A – Main Checklist for Oral Healthcare Missions

Main Checklist for Oral Healthcare Missions

Advance Preparation

❑ Make advance arrangements with local sponsors
❑ Obtain a written letter of support or invitation
❑ Perform a pre-mission site visit (if possible)
❑ Identify available resources

<table>
<thead>
<tr>
<th>Resource</th>
<th>Yes</th>
<th>No</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potable water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If no, what fuel resources, if any, are available (e.g., wood)?

❑ Perform a team health and safety threat assessment (i.e., infectious disease epidemiology)

Team Health and Safety

❑ Provide all personnel with a list of required clothing, personal articles, toiletries, and sundries, including sunscreen, insect repellents, and antidiarrhea medications, as appropriate
❑ Inform all personnel of anticipated health and safety risks
❑ Receive necessary vaccinations and recommended prophylactic medications (e.g., antimalaria medication)
❑ Distribute a trip itinerary and provide a thorough mission briefing (written or oral) prior to departure (NOTE: Appendix K, page 45, provides a mission briefing outline)
❑ Cancel the mission if:
  ❑ adequate disinfection and sterilization of patient-care equipment cannot be identified or obtained
  ❑ safe follow-up of patients cannot be established
  ❑ any unsolvable safety hazards for the team are anticipated

Dental Equipment, Supplies, and Clinic Set-Up

❑ Determine the type of location (e.g., urban or rural)
❑ Identify treatment facility (e.g., a building, a hut)
❑ Identify specialized personal protective equipment as determined by a team health and safety threat assessment (e.g., NIOSH N-95 respirators for tuberculosis-endemic areas)
❑ Identify postexposure prophylaxis medications
❑ Perform a population needs assessment to determine the numbers, types, and treatment needs of patients
❑ Prepare a list of equipment and supplies based on the population needs assessment, available resources, and action reports from previous missions (if available)
❑ Prepare and print sufficient quantities of language- and culture-appropriate patient health history, consent, or other forms and materials
❑ Ensure that potable water is available for drinking and clinical use

Appendix A

Guide for Safety and Infection Control for Oral Healthcare Missions
Appendix A – Main Checklist for Oral Healthcare Missions (continued)

If potable water is not available, determine a water treatment method for making water safe for use:
- Boiling
- Filtration
- Chemical treatment

Ensure that electricity is available, either locally or through other sources (such as a generator).
If electricity is unavailable, determine an alternative method for processing instruments:
- Pressure cooker
- Boiling water over fire
- High-level chemical disinfection

Appropriate Waste Disposal
Make arrangements for managing:
- Sewage
- Solid medical waste disposal
- Chemical waste disposal
- Sharps disposal

Preparing for Travel and Reaching Your Destination
- Arrange for transportation and lodging for each leg on the travel itinerary
- Ensure that all team members have necessary travel documents and identification, including VISAs (where required)
- Identify size and weight restrictions for equipment and supplies based on the most limiting mode of transportation
- Ensure that all items can be safely transported by air or other modes of transportation
- Pack equipment and supplies to prevent damage or spills during transport and to meet airport security requirements
- Identify and address issues relating to customs or import duties in the host country
- Account for all team members at each transit point

Arriving On-Site
- Survey the clinical site, set-up equipment, and secure supplies
- Set up a convenient central location for processing reusable instruments and devices
- Create facilities for handwashing
- Provide infection control training and protective equipment to any local personnel assisting with instrument processing or waste disposal
- Arrange for safe and convenient collection and disposal of medical waste and hazardous items
- Familiarize team members with:
  - Site layout
  - Clinical procedures
  - Infection control practices
  - Exposure management protocols
  - Local hazards
  - Available lavatories
- Establish eating arrangements for team members
Appendix A – Main Checklist for Oral Healthcare Missions (continued)

Guide for Safety and Infection Control for Oral Healthcare Missions

Used with permission from the Organization for Safety, Asepsis and Prevention (OSAP), 2012

Treating Patients

❑ Ensure that all team members use appropriate personal protective equipment and work practices that prevent injury
❑ Ensure that team members wash hands or use alcohol-based handrubs between patients
❑ Dispose of sharps and other medical and chemical wastes safely
❑ Keep a daily log to record:
  ❑ the number of patients treated and procedures performed
  ❑ complications in treatment delivery
  ❑ supply shortages or inventory control issues
  ❑ team safety concerns (e.g., exposures or illnesses)
  ❑ problems with living conditions
  ❑ difficulties in managing patients (e.g., communication problems or lack of compliance with instructions for follow-up)
  ❑ other successes, failures, concerns, or impressions of the day’s events

Returning Home

❑ Write a comprehensive trip report using your daily logs
❑ Medically follow-up and manage any occupational exposures that may have occurred during the trip
❑ Conduct patient follow-up (when indicated or possible)
Appendix B – Instrument/Workload Calculation

**OSAP Instrument Calculation Tool**

This tool assists mission planners in determining the number of instrument kits to bring and how many patients may be seen within a given time frame by a predetermined number of clinicians. Instrument quantities alone may not be the deciding factor in the number of patients treated. Calculating needs beforehand can assist the team in reasonably predicting the number of patients that can receive treatment each day. It also ensures that adequate instruments are on hand, eliminating waiting time for instrument processing and allowing practitioners’ time to be used most efficiently. Never compromise instrument processing to allow more patients to be treated.

To determine instrument needs for the trip, first consider four variables:

- the number of patients you intend to treat each day;
- the time required to clean, sterilize (or high-level disinfect), and dry instruments;
- the per-cycle capacity of the available cleaning and sterilizing equipment; and
- staffing that is available to process instruments.

If a fixed number of kits or instruments can be brought to the site, use this calculation tool to estimate how many patients you can treat in a defined period of time.

**TIP**: Divide instruments into kits rather than sterilizing them separately. This allows staff to more efficiently sort, clean, and deliver processed instruments back to the treatment area. Test-run the kits through the instrument processing equipment that will be used (e.g., autoclave, pressure cooker, pot for boiling water) to determine the number of kits that can be processed in a single cycle.

**Instructions for using the instrument calculation tool**

Select the process you will be using and determine the number of kits that can be processed in a single cycle. Process time includes cleaning, packaging, cooling and drying of instruments. Examples are listed below.

<table>
<thead>
<tr>
<th>Process</th>
<th>Processing time</th>
<th>Capacity (# of kits)</th>
<th>Kits available per 8-hour clinic day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autoclave</td>
<td>60 mins*</td>
<td>8 kits</td>
<td>64 per autoclave</td>
</tr>
<tr>
<td>Dry heat</td>
<td>60 mins*</td>
<td>4 kits</td>
<td>32 per dry heat sterilizer</td>
</tr>
<tr>
<td>Pressure cooker</td>
<td>60 mins</td>
<td>6 kits</td>
<td>48 per pressure cooker</td>
</tr>
<tr>
<td>Boiling water</td>
<td>60 mins</td>
<td>5 kits</td>
<td>40 per pot of water</td>
</tr>
<tr>
<td>Chemical HLD</td>
<td>40 mins*</td>
<td>6 kits</td>
<td>48 per container of HLD</td>
</tr>
</tbody>
</table>

* Process times are determined by the manufacturer and may vary significantly among groups of devices or processes. Always consult manufacturer’s instructions when using traditional heat sterilization methods or chemical germicides.

Adding another device or container and additional staff to process instruments can increase instrument throughput significantly. Because most processes require at least an hour to complete, the number of kits brought on the trip can either limit or expand the number of patients that can be treated each hour (provided adequate personnel also are available).

Begin with a good estimate of the number and type of cases you expect to treat over a given time interval and use the methods described above to calculate instrument, personnel, and processing equipment requirements.

Guide for Safety and Infection Control for Oral Healthcare Missions

Used with permission from the Organization for Safety, Asepsis and Prevention (OSAP), 2012
## Appendix C – Site Evaluation Summary

### OSAP Site Evaluation Summary

1. **Location:**

2. **Mission dates:**

3. **Mission objectives (treatment, education, training):**

4. **Date(s) of site evaluation visit:**

5. **Local persons contacted:**

6. **Climate and weather:**

7. **Infectious disease hazards (malaria, TB, HIV, etc.):**

8. **Noxious or venomous animals (insects, snakes, rabid animals, etc.):**

9. **Personal safety concerns (crime, terrorism, traffic hazards, political unrest):**

10. **Transportation (availability and safety of public transportation, road conditions, etc.):**

11. **Clinic facilities (dental or medical clinic, building of opportunity, portable shelter):**

12. **Dental equipment or supplies available on site (dental chair, unit, light, etc.):**

13. **Personal shelter (hotel, local homes, tents, etc.):**

14. **Sanitation (bathing and latrine facilities):**

15. **Hazardous or medical waste disposal methods (chemical wastes, sharps, blood, teeth, etc.):**

*continued on next page*
16. Water source and quality (potable or non-potable municipal, surface, or well water): 

17. Sources and safety of food (restaurant, local homes, self-prepared, etc.): 

18. Electrical power (local voltage, cycles, reliability, generator availability): 

19. Alternate sources of fuel for heating if electricity is unavailable (wood, charcoal, etc.): 

20. Language and culture (language spoken and availability of translators): 

21. Cultural and political issues: 

---

Notes
Appendix D – Patient Medical Review Form

OSAP Patient Medical Review Form

Patient Name: ________________________________

Patient Birthdate: ____________________________
Month    Day    Year

THIS SECTION MUST BE COMPLETED BY THE PATIENT OR BY AN INTERPRETER

Do you have any of the following illnesses or conditions?  

<table>
<thead>
<tr>
<th>Illness/Condition</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artificial heart valves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Congenital heart defects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart murmur</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart valve defects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rheumatic fever</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Allergies

<table>
<thead>
<tr>
<th>Allergy</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Latex</td>
<td>❑</td>
</tr>
<tr>
<td>Foods</td>
<td></td>
</tr>
<tr>
<td>Medications</td>
<td></td>
</tr>
</tbody>
</table>

Are you under the care of a doctor?  ❑ Yes   ❑ No

Are you taking any medications?  ❑ Yes   ❑ No

If yes, which ones? ________________________________

If yes, please describe. ________________________________

Do you have any problems associated with bleeding?  ❑ Yes   ❑ No

Any other illnesses or conditions that the doctor should know?  ❑ Yes   ❑ No

If “yes,” please describe. ________________________________

THIS SECTION TO BE COMPLETED BY HEALTH PERSONNEL

Blood pressure: ___________ / ___________

Premedication dosage and timing: _________________________

Guide for Safety and Infection Control for Oral Healthcare Missions
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## Appendix E – Worker Health Information Form

**OSAP Worker Health Information Form**

**Worker Name:** ______________________________________________________________

### Contact Person in Case of Emergency

Name: _______________________________________________________________________

Address: ___________________________________________________________________

Home Phone / Cell Phone: _____________________________________________________

Fax Number: ______________________ Email address: _____________________________

Relationship: __________________________

### Medication allergies

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

### Chronic illness(es) requiring ongoing treatment

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

### Prescription medications currently being taken

<table>
<thead>
<tr>
<th>Medication name</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Medical History

- [ ] Diabetes
- [ ] Hypertension
- [ ] Ulcer disease
- [ ] Heart disease
- [ ] Epilepsy
- [ ] Asthma
- [ ] Severe allergies

- [ ] Other
- [ ] Other
- [ ] Other

*Please describe: ____________________________

### Guide for Safety and Infection Control for Oral Healthcare Missions

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Crest® + Oral-B® at dentalcare.com | The trusted resource for dental professionals
Vaccination History

Vaccination or documented immunity to:

- Hepatitis A
- Poliomyelitis
- Hepatitis B
  
  How many doses? □ 3 □ 2 □ 1
  
  On what part of your body did you receive the injections? ______________________
  
  Do you have documentation? □ Yes □ No

- Measles (rubeola)
- German Measles (rubella)
- Tetanus
- Diphtheria
- Whooping Cough (pertussis)
- Mumps

Notes

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Appendix F – Emergency Medical Release Form

OSAP Emergency Medical Release Form

To avoid any unnecessary delay in treatment, all aid workers should fill out and sign this form before departing and turn it in with other important trip materials before arriving at the destination.

Notice to Healthcare Personnel:
Release for Emergency Medical Care

Name: ________________________________________________
Social Security Number: _____________________________
Date of Birth: ______________________________________
Street Address: _____________________________________
City: _______________________________________________
State or Province: ___________________________________
Country: ___________________________________________

If I require emergency medical care, and if I (or an accompanying spouse or relative) am not able to convey permission for treatment in a timely manner, I hereby authorize, by signature below, delivery of appropriate emergency medical care as deemed necessary by emergency medical personnel, a physician, or the medical facility providing treatment.

I have read this entire release and agree to it.

Signature: _________________________________________
Date: _____________________________________________

Witness Name: _______________________________________
Signature: _________________________________________
Date: _____________________________________________
Appendix G – Treatment for Exposures

Prior to departing for the mission, ensure that postexposure supplies are packed and at least one team member is trained in the administration of postexposure medications.

**Hepatitis B Virus**

In most remote locations, laboratory access for source-patient testing or baseline testing of exposed team members for hepatitis B virus (HBV) or hepatitis C virus (HCV) infection is not available. As such, all team members should have documentation of receiving the hepatitis B vaccine series. Because earlier public health recommendations did not call for post-vaccination antibody testing to verify acquired immunity, some members may not know for certain whether they are immune to the virus.* In fact, some may not have responded to the vaccine.

In case of an exposure to HBV:

- If the exposed team member has established immunity, no further treatment or follow-up for HBV infection is needed.
- For workers without documented immunity who are exposed to known or suspected HBV-infected blood, give one dose of hepatitis B immune globulin (HBIG) and a vaccine booster.
- If the exposed worker is a known nonresponder, restart vaccine series.

**Hepatitis C Virus**

No vaccine is currently available to protect against hepatitis C, and no postexposure treatment is known to prevent infection. (Immune globulin is not recommended.) Following recommended infection control practices is imperative, as preventing exposures to blood and body fluids is the only means of protecting against occupational HCV transmission.

**HIV**

Although no vaccine is currently available to protect against HIV, studies suggest that the use of zidovudine (AZT) after certain occupational exposures may reduce the chance of HIV transmission. Because most exposures do not lead to HIV infection and the drugs used to prevent infection can have serious side effects, postexposure medication is not recommended for all occupational exposures.

In case of an exposure to HIV:

- Test the source patient and exposed person (for baseline results) for HIV infection. The OraQuick Rapid HIV-1 Antibody Test is a simple blood-fingerstick test that delivers results within 20 minutes.

* U.S. Centers for Disease Control and Prevention (CDC) recommendations now call for serum testing for HBV antibody titer one to two months after the third dose in the HBV vaccination series. Because levels of circulating antibodies drop over time, testing later than one to two months after completion of the vaccination series cannot reliably verify whether the recipient responded to the vaccine (i.e., developed immunity) or not.
Appendix G – Treatment for Exposures (continued)

"HIV," continued from previous page

If the source patient is HIV-positive and like most dental injuries, the exposure did not involve a large amount of blood, a four-week course of zidovudine and lamivudine is recommended. In more severe cases, a protease inhibitor (indinavir or nelfinavir) may be added. **NOTE:** Guidance may vary on a case-by-case basis. As such, check with an expert before the mission to determine the appropriate drug combinations for various exposure scenarios, or ensure that an expert will be available during the mission. Alternatively, consult the U.S. Centers for Disease Control and Prevention's postexposure prophylaxis hotline (PEPline): 888-448-4911. **NOTE:** This number can only be accessed from the United States.

**Notes**

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Appendix H – Exposure Follow-Up: Returning Home

Manage exposures on-site as well as upon your return home to ensure that any resulting medical conditions are best managed in a timely manner.

Hepatitis B Virus
Because postexposure treatment is highly effective in preventing hepatitis B virus (HBV) infection, follow-up after treatment is not necessary. Nonetheless:

❑ Report any symptoms suggestive of acute hepatitis (e.g., yellow eyes or skin, loss of appetite, nausea, vomiting, fever, stomach or joint pain, extreme fatigue) to your healthcare provider.

Hepatitis C Virus
Following an exposure to blood or body fluids during the mission:

❑ Schedule an antibody test for hepatitis C virus (HCV) and a liver enzyme test (alanine aminotransferase activity) as soon as possible (baseline) and at four to six months after the exposure. NOTE: Some clinicians also recommend another test (HCV RNA) to detect HCV infection four to six weeks after the exposure.

❑ Report any symptoms (as described for hepatitis B above) to your physician.

HIV
In addition to baseline testing for HIV antibody as soon as possible after exposure:

❑ Get tested for HIV periodically for at least six months after the exposure (e.g., at six weeks, 12 weeks, and six months).

❑ If antiviral drugs had been prescribed as part of postexposure treatment, have a complete blood count as well as kidney and liver function tests to check for drug toxicity. Ideally, these tests should be performed before beginning treatment and two weeks after treatment has started.

❑ Contact your physician if you experience sudden or severe flu-like illness during the follow-up period, especially if it involves fever, rash, muscle aches, fatigue, malaise, or swollen glands. Any of these may suggest HIV infection, drug reaction, or other medical conditions.
## Appendix I – Sterilization and High-Level Disinfection

<table>
<thead>
<tr>
<th>Agent / Process</th>
<th>Form</th>
<th>Efficacy</th>
<th>Corrosiveness</th>
<th>Health hazards</th>
<th>Disposal issues*</th>
<th>Contact Time</th>
<th>Use life</th>
<th>Reuse life</th>
<th>Test strip available?</th>
<th>FDA 510(k) / CE Mark? **</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steam autoclave</td>
<td>Device</td>
<td>Sterilize</td>
<td>Minimal</td>
<td>N/A</td>
<td>N/A</td>
<td>20-30 min</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>FDA/CE</td>
</tr>
<tr>
<td>Pressure Cooker</td>
<td>Device</td>
<td>Sterilize</td>
<td>Moderate</td>
<td>Scalding</td>
<td>N/A</td>
<td>30 min†</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Boiling Water</td>
<td>Liquid</td>
<td>HLD</td>
<td>Moderate</td>
<td>Scalding</td>
<td>N/A</td>
<td>20 min HLD²</td>
<td>N/A</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Household Bleach (5.25% NaOCl)</td>
<td>Liquid</td>
<td>HLD</td>
<td>Moderate to Severe</td>
<td>Cautic</td>
<td>Dilute to reduce Cl concentration to &lt;20ppm</td>
<td>10 min HLD</td>
<td>24 hrs</td>
<td>No</td>
<td>No</td>
<td>(off-label use)</td>
</tr>
<tr>
<td>Orthophthaldehyde</td>
<td>Liquid</td>
<td>Sterilize or HLD</td>
<td>None</td>
<td>Eye, skin, respiratory irritation; sensitization</td>
<td>Do not discard in lakes or streams</td>
<td>6-10 hrs sterlization; 20-45 min HLD</td>
<td>14-30 days</td>
<td>Yes</td>
<td>Yes</td>
<td>FDA/CE</td>
</tr>
<tr>
<td>Hydrogen Peroxide (7.5% H₂O₂)</td>
<td>Liquid</td>
<td>Sterilize or HLD</td>
<td>Minimal</td>
<td>Serious eye hazard; skin, respiratory irritation</td>
<td>Do not discard in lakes or streams</td>
<td>6 hrs sterlization; 30 min HLD</td>
<td>21 days</td>
<td>21 days</td>
<td>Yes</td>
<td>FDA/CE</td>
</tr>
<tr>
<td>Peroacetic acid and hydrogen peroxide</td>
<td>Powder (mix with water)</td>
<td>Sterilize</td>
<td>Minimal</td>
<td>Eye irritant</td>
<td>None</td>
<td>10 min sterlization</td>
<td>24 hrs after mixing</td>
<td>24 hrs</td>
<td>Yes</td>
<td>CE</td>
</tr>
</tbody>
</table>

** HLD = High-level disinfection  
NaOCl = Sodium hypochlorite  
ppm = parts per million

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Visit [www.fda.gov/cdrh/ode/germlab.html](http://www.fda.gov/cdrh/ode/germlab.html) for a list of available chemical sterilants/high-level disinfectants with tradenames, manufacturers, and active ingredient.

* Comply with national and local laws and regulations for use and disposal of sterilants and high-level disinfectants.

** FDA clearance to market, also referred to as a “510(k)” is required for all chemical sterilants and high-level disinfectants marketed in the United States. CE marking is a declaration by a manufacturer that the product meets all the appropriate provisions of relevant legislation that implements certain European Directives.

† Pressure cookers can be used for sterilization if they maintain a temperature of 250°F (121°C) at a pressure of 15 pounds for 30 minutes.

‡ Follow instructions on page 19 of this guide for using boiling water to process dental instruments.

* Comply with national and local laws and regulations for use and disposal of sterilants and high-level disinfectants.

** FDA clearance to market, also referred to as a “510(k)” is required for all chemical sterilants and high-level disinfectants marketed in the United States. CE marking is a declaration by a manufacturer that the product meets all the appropriate provisions of relevant legislation that implements certain European Directives.

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### Appendix J – Oral Care Humanitarian Mission Briefing

**OSAP** Oral Care Humanitarian Mission Briefing

1. **Mission overview and objectives** (patient treatment, patient education, professional education and training):

2. **Trip Itinerary:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Arrival or Departure</th>
<th>Meeting Place, Arrival/Departure Locations</th>
<th>Transportation (Flight No., Bus, etc.) / Reason for Stop</th>
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<tbody>
<tr>
<td>Arrive / Depart</td>
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</table>

3. **Emergency contact information:**

   - **Team Leader:**
   - **Sponsoring organization contact:**
   - **Nearest embassy or consulate in host country:**
   - **Other:**

4. **Required / recommended personal articles:**

   - Personal prescription medications for ______ days
   - Prophylactic medications (if required) for ______ days
   - Prescription eyewear (and a spare pair of glasses) and safety glasses/goggles with solid side shields
   - Personal hygiene articles (e.g., toothbrush, floss, soap, shampoo, feminine hygiene):

   continued on next page
Appendix J – Oral Care Humanitarian Mission Briefing (continued)

Required / recommended personal articles, continued from previous page

❑ Sunscreen, sunglasses, insect repellent (if indicated)

❑ Special clothing (e.g., caps, cold weather gear, sun visors): ________________________________

❑ Earplugs (they can aid in sleeping)

❑ Other: ___________________________________________________________________

5. Safety precautions:

❑ Anti-terrorism and crime precautions: _________________________________________________

❑ Infectious disease precautions (including food and water): __________________________________________________________________________

❑ Clinical safety precautions (vaccinations, bloodborne pathogens training, including postexposure management): _______________________

❑ Travel precautions (seat belts, road hazards, etc.): _____________________________________

❑ Other: _______________________________________________________________________

6. Language and culture:

❑ Traveler’s dictionary or phrase book (optional)

❑ Glossary of medical and dental terms (optional)

❑ General overview of history, customs, and cultural issues that may influence mission success: ________________________________

❑ Other: _______________________________________________________________________

❑ After-Action Reports from previous missions to this location

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Appendix K – After-Action Mission Report Template

After-Action Mission Report Template

Location(s) Visited: _______________________________ Mission Dates: ____________________

Mission Team Leader: ______________________________________________________________
Phone: _________________ Fax: _________________ Email address: ______________________

Mission Summary. Broadly summarize the overall mission and include information on the composition of the team, sponsor(s), significant milestones and events that occurred during planning, preparation, execution and recovery.

______________________________________________________________________________
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Team Composition. List all team members including their professional titles, licensure, affiliation, and contact information. Attach a separate sheet if necessary.

______________________________________________________________________________
______________________________________________________________________________
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Sponsor(s). List all organizations or individuals providing support (financial or in-kind) for the mission.

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Local Host Interaction(s). Provide name and contact information of individuals that provided assistance during the mission. Describe any difficulties that may have arisen and provide suggestions as to how these may be avoided in the future. Use an attachment if necessary.

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Observations and Recommendations. Adequately describe key problem areas. Be very specific. If problems involved equipment or materials, provide detailed item descriptions, including brand names, part numbers, and quantities. List problem areas in order of importance. If making a recommendation for improvement, identify the appropriate administrative level for corrective action, e.g., team leader, individual team members, sponsor. List a short title for each observation, describe the problem, and provide a recommendation. Use the following example as a guide:

1. Translator Support Issues
Observation: Translators are mission-essential, and serious problems can arise if they cannot perform their duties. Our translator asked us to extract a non-emergent carious third molar on the first day of the mission at the remote site. After having the tooth removed, she developed a post-operative infection with muscle trismus treatment and could not speak. As a result we were without effective translation services for three days.

Recommendation: Teams should avoid performing non-emergency invasive treatment on translators or other mission-essential personnel if there is no one else who can perform their duties.

continued on next page
For supply issues, each recommendation for modifications, additions, and deletions must contain a complete item description, cost, and quantity and be coordinated with medical material prior to submission of this report. The following example illustrates this point:

### 2. Inadequate numbers and types of molar extraction forceps

**Observation:** We had insufficient numbers of molar extraction forceps, especially #17s, to permit prompt sterilization turnaround. Each kit contained four #23s and four #17s, but the dentists on this mission were not as comfortable using the #23 as the #17, which resulted in a wait for the #17s to be processed and an occasional slowing in the flow of patients.

**Recommendation:** Planners should assess mission dentists' preferences and adjust kit contents accordingly. For example, with this mission’s team, increasing the numbers of molar forceps in the kits from 8 to 12 (i.e., if each kit contained eight #17s and four #23s) would have improved instrument turnaround time.

**Observations and Recommendations.**
Appendix K – After-Action Mission Report Template (continued)

**Environment, Health, Safety, and Cultural Information.** Include data on climate, weather, environmental factors, topography, etc., that could affect future mission success. Identify situations of medical importance or other significant hazards encountered. If applicable address the following:

- **Community, Environment, and Sanitation:**
  - Health services (availability, quality): ____________________________________________________________________________
  - Water supply: ________________________________________________________________________________________________
  - Sewage disposal: ______________________________________________________________________________________________
  - Local restaurants: ______________________________________________________________________________________________
  - Insects and animals affecting health: ______________________________________________________________________________
  - Poisonous fish and plants: _________________________________________________________________________________________
  - Safety of food and dairy products: ________________________________________________________________________________

- **Health and Safety Issues** (including diseases and prophylactic measures):
  ________________________________________________________________________________________________________________

- **Cultural Issues** (including specific observations on traditions and customs):
  ________________________________________________________________________________________________________________

**Lessons Learned.** Provide a strategic summary of trials and triumphs encountered by the team during all phases of the mission, including team health and safety, healthcare delivery, logistics, shelter, equipment, supplies, and transportation. Whereas the problems described in the “Observations and Recommendations” section are very specific in nature, this section provides a broader, “big picture” view to consider for the next humanitarian aid mission.

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Additional comments. Use this space to share any additional thoughts not addressed in previous sections.

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Course Test Preview
To receive Continuing Education credit for this course, you must complete the online test. Please go to: www.dentalcare.com/en-us/professional-education/ce-courses/ce397/start-test

1. The average length of a dental mission is _________.
   a. 3 days
   b. a week
   c. 14 days
   d. a month

2. Your US dental license ________ allow(s) you to practice in a foreign country.
   a. automatically
   b. does not automatically

3. The most frequent cause of illness on missions is___________.
   a. insect bites
   b. skin infections
   c. eye infections
   d. gastrointestinal infections

4. How far in advance (prior to departure) should you inform your physician that you will be traveling to an area that may have limited resources?
   a. Ten days
   b. 4-6 weeks
   c. Six months
   d. 9-12 months

5. The Centers for Disease Control and Prevention (CDC) publishes every two years, a reference for those who advise international travelers about health risks. It is called the ________ Book.
   a. Travel
   b. Health Risks
   c. Yellow
   d. Blue

6. Which of the following vaccines is required by International Health Regulations for travel to certain countries in sub-Saharan Africa and tropical South America?
   a. Yellow fever
   b. Hepatitis A
   c. Polio
   d. Influenza

7. A needlestick injury is an example of which route of disease acquisition?
   a. Direct contact
   b. Indirect contact
   c. Droplet infection
   d. Airborne route
8. There is no vaccine available against ________.
   a. hepatitis B
   b. rubella
   c. Zika virus
   d. measles

9. A medical mission ____________.
   a. involves travel only to foreign countries
   b. involves travel only within the United States
   c. can involve foreign and/or domestic travel

10. Specific information regarding issues of personal safety when traveling internationally is available from the ____________.
    a. Department of State
    b. Department of Transportation
    c. Department of Homeland Security
    d. Centers for Disease Control and Prevention

11. A dental mouth mirror is an example of a ________ patient-care item.
    a. critical
    b. semi-critical
    c. non-critical

12. Is there any evidence that using antiseptics or squeezing a wound reduces the risk of transmission of a bloodborne pathogen?
    a. Yes
    b. No

13. Sterilizing instruments using a pressure cooker involves an exposure time of ________ minutes, and may only be considered in an emergency and as an absolute last resort.
    a. 5
    b. 10
    c. 20
    d. 30

14. The most common recommended oral medication taken prior to, during and after a foreign mission is for ________.
    a. E. Coli
    b. tulanemia
    c. malaria
    d. shigella

15. All body fluids are subject to standard precautions EXCEPT ________.
    a. tears
    b. blood
    c. sweat
    d. mucus
16. The single most important infection prevention activity in healthcare is __________.
   a. surface disinfection
   b. hand hygiene
   c. disposable gloves
   d. masks

17. When local water quality is questionable, __________.
   a. use alcohol based hand sanitizers when hands are not visibly soiled
   b. if hands are soiled, clean first with pre-boiled water or pre-moistened towelettes with a cleaning agent
   c. put on new gloves without performing hand hygiene
   d. A and B
References
About the Authors

Curt Hamann, MD

Dr. Curt Hamann completed his medical school/rotating internship in preventive medicine at Loma Linda University (‘88) subsidized by a dental office partnership with his wife, Beth Hamann DDS (‘85). They purchased and merged two dental practices in Rialto where Dr. Curt hired and managed the business and Beth the clinical staff for nearly 10 years. One of Dr. Beth’s lead dental assistants developed an occupationally debilitating contact dermatitis which sent Dr. Curt on a Sherlockian pursuit of a diagnosis catalyzing a 25 year clinical passion for the importance of diagnosis driven management of occupational allergies in dentistry. Clinical research subsequently led to over 75 peer reviewed articles and book chapters in the areas of immediate and delayed allergy. Dr. Beth, like many in dentistry, began experiencing hand symptoms consistent with carpal tunnel syndrome.

Despite being quickly given a presumptive diagnosis of CTS they together used oximetry to determine that her hand pain and fatigue was due to impaired thumb oxygenation from poor fitting exam gloves rather than damage to the median nerve. These two practical problems in dentistry inspired Dr. Curt to create examination and surgical glove solutions designed to minimize allergy and ergonomic problems in healthcare which they now produce in Southeast Asia and distribute worldwide.

They also inspired an ongoing 18 year collaboration with the American Dental Association testing dental personnel at annual meetings creating the worlds most comprehensive database for the incidence and prevalence of both latex allergy and median nerve neuropathy. This epidemiologic data has been summarized in featured cover articles in JADA and has been used by the ADA in deliberation with Federal OSHA. Dr. Curt was one of the consultant authors working with the Federal Government in the development of the Dental Infection Control Guideline published by the Centers for Disease Control and Prevention and served for 6 years on the board of directors of OSAP (Organization for Safety and Asepsis Procedures). Dr. Curt is CEO of SmartPractice, Inc a Top 50 privately held Arizona company and live in Paradise Valley, Arizona. In addition Dr. is an adjunct professor at Loma Linda University School of Dentistry and founding director of the Contact Dermatitis Institute.

Charles John Palenik, MS, PhD, MBA

Dr. Palenik recently retired after 30 years at Indiana University School of Dentistry. He held a number of academic and administrative positions including Professor of Oral Microbiology, Director/Human Health & Safety, Director/ Central Sterilization Services and Chairman/Infection Control and Hazardous Materials Management Committees. Dr. Palenik has published over 200 articles, 315 monographs, 88 research abstracts, three books and seven book chapters, the majority of which involve infection control and human safety and health.

In addition, he has provided 125 continuing education courses throughout the United States and nine foreign countries.

Email: cpalenik@iupui.edu