# Myanmar Dental Association

# Infection control in dental practice

## Guide lines for general dental practitioners

## 2011

# Infection control in dental practice

## Introduction

Dental professionals are exposed to a wide variety of micro-organisms in the blood and saliva of patients. These micro-organisms can cause diseases such as the common cold, herpes, and pneumonia, and serious infectious diseases such as tuberculosis, hepatitis B & C and acquired immune deficiency syndrome (AIDS). The emergence of the bloodborne pathogens and the increasing number of infected patients who seek oral health care compel clinicians to have a thorough knowledge about bloodborne diseases and the medical/dental management of the care of patients presenting with HIV, HBV or HCV infection. In the health care setting, blood-borne pathogen transmission occurs predominantly by percutaneous or mucosal exposure of health care workers (HCWs) to the blood or body fluids of infected patients. Prospective studies of HCWs have estimated that the average risk for HIV transmission after a percutaneous exposure is approximately 0.3%, the risk of HBV transmission is 1 to 62%, and the risk of HCV transmission is approximately 1.8%. To minimize the risk of blood-borne pathogen transmission from HCWs to patients, all HCWs should adhere to standard precautions, including the appropriate use of hand washing, protective barriers, and care in the use and disposal of needles and other sharp instruments. Cross infection between dental surgeons, dental assistants, dental technicians and patients can be prevented by the use of effective infection control procedures and universal precautions in dental office.

Globally, HIV is transmitted mainly by sexual practices and intravenous drug use and due to its long asymptomatic period means healthcare-associated HIV transmission receives little attention even though an estimated 5.4% of global HIV infections result from contaminated

injections alone. It is an important personal issue for healthcare workers (HCWs), especially those who work with unsafe equipment or have insufficient training. They may acquire HIV occupationally or iatrogenically pass HIV infections to other patients.

The probability of infection after exposure of a susceptible person to HBV or HCV depends on the route of exposure, the concentration of infectious virions in the implicated body fluid, and the volume of infective material transferred. Transmission of HBV and HCV may result from percutaneous or mucosal exposures to blood. Some body fluids also are considered potentially infectious. HBV and HCV do not spontaneously penetrate intact skin, and airborne transmission does not occur.

HBV can be present in blood and body fluids, including saliva, semen, and vaginal secretions, with concentrations ranging from a few virions to $10^9$ virions/mL. The highest concentrations are present in individuals whose serum has detectable hepatitis B e antigen (HBeAg), which is indicative of active HBV replication. The concentration of HBV in body fluids such as semen and saliva is generally 1000–10,000 times lower than that found in blood. HBV is resistant to drying, simple detergents, and alcohol, and it has been found to survive at room temperatures for ≥7 days. Inactivation of HBV can be achieved using several intermediate-level disinfectants, including 0.1% glutaraldehyde and 500 p.p.m. free chlorine from sodium hypochlorite (i.e., 2 tablespoons [~30 mL] of household bleach in 1 gallon [3.8 L] of water). Because infected patients can have high concentrations of HBV in blood or body fluids and HBV is stable at ambient temperatures, transmission of HBV can occur in health care settings through inapparent modes, such as exposure to contaminated environmental surfaces or equipment that have been inadequately disinfected or through exposures of nonintact skin (i.e., skin that is chapped or abraded).

Serum concentrations of HCV generally range from $10^5$ to $10^8$ genome equivalents per milliliter. A recent study suggests that HCV in dried

plasma can cause infection in experimental animals when left at room temperature for ≥16 h but not longer than 4 days. However, epidemiologic data indicate that environmental contamination is not a common route of transmission. Conventional sterilization processing, such as steam autoclaving or use of chemical germicides that are capable of producing at least an intermediate level of disinfection activity, are thought to be suitable for inactivating HCV.

## Recommended infection control practices for dentistry

Previous recommendations on infection control for dentistry (Center for Disease Control, CDC, 1986, 1993) focused on the use of ***Universal Precautions*** to prevent transmission of blood-borne pathogens. Universal Precautions were based on the concept that all blood and certain body fluids should be treated as infectious because it is impossible to know who may be carrying a blood-borne virus. Thus, Universal Precautions should apply to all patients.

The relevance of Universal Precautions applied to other potentially infectious materials was recognized, and in 1996, CDC replaced Universal Precautions with ***Standard Precautions***. Standard Precautions integrate and expand Universal Precautions to include organisms spread by:

- Blood.
- All body fluids, secretions, and excretions except sweat, regardless of whether they contain blood.
- Non-intact skin.
- Mucous membranes.

Saliva has always been considered a potentially infectious material in dental infection control; thus, no operational difference exists in clinical dental practice between Universal Precautions and Standard Precautions.

Standard Precautions include:

1. Handwashing.
2. The use of personal protective equipment, such as gloves, masks, eye protection, and gowns, that are intended to prevent the exposure of skin and mucous membranes to blood and other potentially infectious materials.
3. Proper cleaning and decontamination of patient care equipment.
4. Cleaning and disinfection of environmental surfaces.
5. Injury prevention through engineering controls or safer work practices.

**1. Hand washing and care of hands**

Dental health care personnel (DHCP) should wash their hands before and after treating each patient (i.e. before glove wearing and after glove removal) and after barehanded touching of inanimate objects likely to be contaminated with blood, saliva or respiratory secretions. Soap and water will remove transient micro-organisms acquired directly or indirectly from patient contact. Therefore, for many routine dental procedures such as examinations and non-surgical treatments, hand washing with plain soap is adequate. For surgical procedures, an antimicrobial surgical hand scrub should be used.

When gloves are torn, cut or punctured, they should be removed as soon as patient safety permits. Then, DHCP should wash their hands thoroughly and reglove to complete the dental procedure. DHCP who has exudative lesions or weeping dermatitis, particularly on the hands, should refrain from all direct patient care and from handling dental care equipments until the condition resolves.

2. **Personal protective equipment (PPE)**

Personal protective equipment (PPE), or barrier precautions, are a major component of Standard Precautions. Use of rotary dental and surgical instruments (e.g., handpieces, ultrasonic scalers) and air-water syringes creates a visible spray that contains primarily large-particle droplets of water, saliva, blood, microorganisms, and other debris. This spatter travels only a short distance and settles out quickly, landing either on the floor, operatory surfaces, dental health care personnel (DHCP), or the patient. PPE is essential to protect the skin and the mucous membranes of DHCP from exposure to infectious or potentially infectious materials. PPE should be worn whenever there is potential for contact with spray or spatter and should be removed when leaving treatment areas. A standard surgical mask that covers the nose and mouth is worn to protect the mucous membranes from spatter generated during dental procedures. Eye protection with solid side shields or a face shield should also be worn. A mask should be changed between patients or if it becomes wet during patient treatment. Clean reusable face protection with soap and water between patients; if visibly soiled, clean and disinfect. DHCP should wear long-sleeved disposable or reusable gowns, lab coats, or uniforms that cover skin and personal clothing likely to become soiled with blood, saliva, or infectious material (e.g., when spatter and spray of blood, saliva, or other potentially infectious material to the forearms might occur). DHCP should change protective clothing when it becomes visibly soiled or as soon as possible if penetrated by blood or other

potentially infectious fluids. All protective clothing should be removed before leaving patient care or laboratory areas.

Gloves are worn for three reasons:

- To minimize the risk of health care personnel acquiring infections from patients.
- To prevent pathogenic organisms from being transmitted from health care personnel to patients.
- To reduce contamination of health care personnel's hands by organisms that can be transmitted from one patient to another.

Wearing gloves does not eliminate or replace the need for hand washing. Hand hygiene should be performed immediately prior to putting on and after removal of gloves. Gloves might have small holes or tears that are not noticeable, or hands can become contaminated as gloves are removed. Such circumstances increase the risk of wound contamination and exposure of the DHCP's hands to microorganisms from patients. For the protection of DHCP and patients, gloves should always be worn when contact with blood, saliva, and mucous membranes is possible. Gloves should be removed after patient care and hands should be immediately washed. Hands should also be washed before putting gloves on. If the integrity of a glove is compromised by tears, cuts, or punctures, it should be changed as soon as possible. Surgical or examination gloves should not be washed before use, nor should they be washed, disinfected, or sterilized for reuse. Washing of gloves can cause a condition known as "wicking," or penetration of liquids through undetected holes in the gloves. These circumstances may increase the risk of wound contamination and exposure of the DHCP's hands to microorganisms from patients. Disinfecting agents, oils, certain oil-based lotions, and heat treatments such as autoclaving may result in deterioration of gloves.

3. **Sterilization and Disinfection of Patient Care Items**

As with other medical and surgical instruments, dental instruments are classified into three categories depending on their risk of transmitting infection and the need to sterilize them between uses.

(1) Critical: Surgical and other instruments used to penetrate soft tissue or bone are classified as critical and should be sterilized after each use. These include forceps, scalpels, bone chisels, scalers, hand instruments, endo syringes, Duoloid syringes, diamond strips, PFI, para posts, peeso reamer, endo files, ultrasonic scaler and burs.

(2) Semi-critical: Instruments such as mirrors, impression trays and amalgam condensers that do not penetrate soft tissues or bone but contact with oral tissues are classified as semi-critical. These should be sterilized after each use. If, however, sterilization is not feasible because the instrument will be damaged by heat, the instrument should receive, at a minimum, high-level disinfection. Dental handpieces are a special case. Even though they do not penetrate soft tissue, it is difficult for chemical germicides to reach the internal parts of handpieces. For this reason, they should be heat sterilized using a steam autoclave or chemical vapor sterilizer.

(3) Non-critical: Instruments or medical devices such as external components of X-ray heads, facebows, pulse oximeter, and blood pressure cuff that come into contact only with intact skin are classified as non-critical. Because these have a relatively low risk of transmitting infection, they may be reprocessed between patients with intermediate or low-level disinfection or detergent and water washing, depending on the nature of the surface and the degree and nature of the contamination.

To prevent cross-contamination, the instrument processing area should be physically or spatially divided into regions for cleaning, packaging, sterilization, and storage.

- In the cleaning area, reusable contaminated instruments are received, sorted, and cleaned.
- The packaging area is for inspecting, assembling, and packaging clean instruments in preparation for final sterilization.

The sterilization and storage area contains the sterilizers and related supplies. Cleaning is the basic first step in all decontamination processes. Cleaning involves the physical removal of debris and reduces the number of microorganisms on an instrument or device. If visible debris or organic matter is not removed, it can interfere with the disinfection or sterilization process. Automated or mechanical cleaning equipment, such as ultrasonic cleaners, instrument washers, and washer-disinfectors, are commonly used to clean dental instruments. Automated cleaners increase the efficiency of the cleaning process and reduce the handling of sharp instruments. After cleaning, instruments should be rinsed with water to remove chemical or detergent residue. If manual cleaning is necessary, soak instruments in a rigid container filled with detergent, disinfectant/detergent, or an enzymatic cleaner. This step prevents drying of patient material and makes cleaning easier and less time consuming.

- Do not use high-level disinfectants/sterilants (e.g., glutaraldehyde) as instrument-holding solutions.
- To avoid injury from sharp instruments, personnel should wear puncture-resistant, heavy-duty, utility gloves (i.e., not patient care gloves) when handling or manually cleaning contaminated instruments and devices. To protect against splashes, a facemask, eye protection or face shield, and a gown or jacket should be worn.

After thorough cleaning and drying of instruments, critical and semi-critical instruments that will be stored before use should be wrapped or placed into container systems prior to heat sterilization. This step protects items from contamination after the sterilization cycle and during storage.

Open or unlock hinged instruments so that all surfaces are exposed. Place a chemical indicator inside each wrapped package. If the indicator cannot be seen from the outside, place another indicator (e.g., indicator tape) on the outside of the package. Always wear heavy-duty, puncture-resistant utility gloves while inspecting and packaging instruments.

**Methods for sterilization and disinfection**

All instruments must be cleaned thoroughly before being sterilized or disinfected. Soaking for 30 minutes in a chemical disinfection before cleaning will give further protection to the personnel from exposure to infection during the process of cleaning.

**Sterilization by steam**

Steam sterilization (autoclaving) is the method of choice for reusable medical instruments. Autoclaves and pressure cookers should be operated at 121$^{o}$C (250$^{o}$F) equivalent to a pressure of 1 atmosphere (101kPa, 15lb/in$^{2}$) above atmospheric pressure, for a minimum of 20 minutes.

**Sterilization by dry heat**

Sterilization by dry heat at 170$^{o}$C (340$^{o}$F) for 2 hours in an electric oven is an appropriate method for instruments that can withstand such temperature. An ordinary electric household oven is satisfactory for dry heat sterilization.

**High-level disinfection by boiling**

Boiling for 20 minutes is the simplest method for inactivating most pathogenic microbes, including HIV and Hepatitis B virus. But boiling should be used only when sterilization by steam or dry heat is not available.

**High-level disinfection by soaking in chemicals**

The CDC *Guideline for Environmental Control* prepared in 1981 as a guide to the appropriate selection and use of disinfectants has undergone several important changes. First, formaldehyde-alcohol has been deleted as a recommended chemical sterilant or high-level disinfectant because it is irritating and toxic and not commonly used. Second, several new chemical sterilants have been added, including hydrogen peroxide, peracetic acid and peracetic acid and hydrogen peroxide in combination. Third, 3% phenolics and iodophors have been deleted as high-level disinfectants because of their unproven efficacy against bacterial spores, *M. tuberculosis,* and/or some fungi. Fourth, isopropyl alcohol and ethyl alcohol have been excluded as high-level disinfectants because of their inability to inactivate bacterial spores and because of the inability of isopropyl alcohol to inactivate hydrophilic viruses (i.e., poliovirus, coxsackie virus). Fifth, a 1:16 dilution of 2.0% glutaraldehyde-7.05% phenol-1.20% sodium phenate (which contained 0.125% glutaraldehyde, 0.440% phenol, and 0.075% sodium phenate when diluted) has been deleted as a high-level disinfectant because this product was removed from the marketplace in December 1991 because of a lack of bactericidal activity in the presence of organic matter; a lack of fungicidal, tuberculocidal and sporicidal activity; and reduced virucidal activity. Sixth, the exposure time required to achieve high-level disinfection has been changed from 10-30 minutes to 12 minutes or more depending on the FDA-cleared label claim and the scientific literature. In addition, many new subjects have been added to the guideline. These include inactivation of emerging pathogens, bioterrorist agents, and bloodborne pathogens; toxicologic, environmental, and occupational concerns associated with disinfection and sterilization practices; disinfection of patient-care equipment used in ambulatory and home care; inactivation of antibiotic-resistant bacteria; new sterilization processes, such as hydrogen peroxide gas plasma and liquid peracetic acid; and disinfection of complex medical instruments.

The chemical agents for high level disinfection include ≥2.4% glutaraldehyde-based formulations, 7.5% stabilized hydrogen peroxide, 0.2% peracetic acid, 7.35% hydrogen peroxide with 0.23% peracetic acid, 0.08% peracetic acid with 1.0% hydrogen peroxide.

**Intermediate and low level disinfectants**

Ethyl or isopropyl alcohol (70-90%), Sodium hypochlorite (5.25-6.15% household bleach diluted 1:500 provides >100 ppm available chlorine), Phenolic germicidal detergent solution, Iodophor germicidal detergent solution and Quaternary ammonium germicidal detergent solution

## 4. Cleaning and disinfection of environmental surfaces

There are two categories of environmental surfaces.

Clinical contact surfaces have a high potential for direct contamination from patient materials either by direct spray or spatter generated during dental procedures or by contact with DHCP's gloved hand. Examples of clinical contact surfaces are light handle, countertop, bracket tray, dental chair, and door handle Because clinical contact surfaces come into direct contact with contaminated gloves, instruments, spray or spatter, their risk of transmitting infection is greater than for housekeeping surfaces. These surfaces can subsequently contaminate other instruments, devices, hands, or gloves. Surface barriers can be used to protect clinical contact surfaces and changed between patients. Surface barriers are particularly useful for surfaces that are hard to clean, such as switches on dental chairs. This practice will also reduce exposure to harmful chemical disinfectants. If surface barriers cannot be used, clean and then disinfect the surface with an EPA-registered hospital disinfectant effective against HIV and HBV (low-level disinfectant). If the surface is visibly contaminated with blood or other patient material, clean and then disinfect the surface with an EPA-registered

hospital disinfectant with a tuberculocidal claim (intermediate-level disinfectant).

Housekeeping surfaces do not come into contact with patients or devices used in dental procedures. Therefore, they have a limited risk of disease transmission. Examples of housekeeping surfaces are walls, sinks, and floors. Housekeeping surfaces carry the least risk for transmitting infections in dental settings. On a routine basis, these surfaces should be either cleaned with soap and water or an EPA-registered detergent/hospital disinfectant. Wet mops and cloths may become contaminated with microorganisms, so clean the mop and cloths after use and allow them to dry thoroughly before re-using. Prepare fresh cleaning and disinfecting solutions daily and per manufacturer recommendations.

## 5. Injury prevention through engineering controls or safer work practices

Work practice controls are behavior based and are intended to reduce the risk of blood exposure by changing the manner in which a task is performed.

Examples include the following:

- Using instruments instead of fingers to retract or palpate tissue during suturing and administration of anesthesia.
- One-handed needle recapping.

Engineering controls reduce exposure either by removing, eliminating, or isolating the hazard from the worker. These controls are frequently technology based and often incorporate safer designs of instruments and devices.

Examples include the following:

- Sharps containers.
- Medical devices with injury protection features, such as self-sheathing needles and scalpels.

**a. Use and care of sharp instruments and needles**

Sharp items (e.g. needles, scalpel blades, wires) contaminated with patient's blood and saliva should be considered as potentially infective and handled with care to prevent injuries.

Used needles should never be recapped or manipulated utilizing both hands or any other technique that involves directing the point of a needle towards any part of the body. Either a one-handed scoop technique or a mechanical device designed for holding the needle sheath should be employed. Used disposable syringes and needles, scalpel blades, and other sharp items should be placed in appropriate puncture-resistant containers located as close as is practical to the area in which items are used. Bending or breaking of needles before disposal is not recommended.

Before attempting to remove needles from non-disposable aspirating syringes, DHCP should recap them to prevent injuries. Either of the two acceptable techniques may be used. For procedures involving multiple injections with a single needle, the unsheathed needle should be placed in a location where it will not become contaminated or contribute to unintentional needle sticks between injections. If the decision is made to recap a needle between injections, a one-handed scoop technique or a mechanical device designed to hold the needle sheath is recommended.

Regulated medical waste requires careful containment for treatment or disposal. A single leak-resistant biohazard bag is usually adequate to

contain non-sharp, regulated medical waste. Puncture-resistant containers with a biohazard label, such as sharps containers, are used as containment for scalpel blades, needles, syringes, and unused sterile sharps.

**b. Handling of biopsy specimen, extracted teeth, impressions, bite registrations, articulators, prostheses and radiographs**

To protect the people handling and transporting biopsy specimens, each specimen must be placed in a sturdy, leak-proof container with a secure lid to prevent leakage during transport. Care should be taken when collecting the specimen to avoid contaminating the outside of the container. If the outside of the container becomes visibly contaminated, it should be cleaned and disinfected or placed in an leak-proof bag. The container also must be labeled with a biohazard symbol.

Extracted teeth that are being discarded are considered infectious and should be treated as regulated medical waste. Extracted teeth containing amalgam should not be placed in a medical waste container that uses an incinerator for final disposal.

Dental prostheses, such as crowns, full and partial dentures, orthodontic appliances, and items used in their fabrication are potential sources of contamination in the dental laboratory. As such, they should be handled in a manner that protects patients and DHCP from exposure to microorganisms.

For impressions and registrations, put on protective attire (gloves, mask, and eyewear), use a clean lab pan, articulator and facebow for each patient. Use a sterile metal impression tray, a disposable plastic tray, or a new custom tray. Use a clean mixing bowl and a sterile spatula; disposable

mixing pad; or a sterile glass slab. Remove tray from patient's mouth and rinse thoroughly with water. Place impression in zip-lock plastic bag, pour in laboratory disinfectant to cover completely. Allow 10 minutes contact time, remove immediately to prevent distortion. Rinse thoroughly before sending to the lab or pouring with stone. Remove wax rims or wax bites from patient's mouth and rinse to remove blood and gross debris. Clean by pouring laboratory disinfectant over all surfaces. Drain and repeat application of laboratory disinfectant to all surfaces. Place item in zip-lock plastic bag and seal. Allow 10 minutes contact time. Rinse thoroughly prior to sending to the lab or handling.

Prostheses, orthodontic appliances and prosthodontic materials should be cleaned, disinfected with an intermediate-level disinfectant, and rinsed before and after being manipulated. Wear gloves and other appropriate personal protective equipment (PPE) until disinfection has been completed. For trimming and polishing of prostheses and appliances, use a sterile acrylic bur and handpiece for adjustments. Use a sterile rag wheel, bristle brush, or felt cone for each case. Take a unit dose of pumice, wet with laboratory disinfectant to make a slurry. Discard any remaining pumice to avoid cross-contamination. Pumice pan is lined with plastic and changed daily. Rinse the prosthesis under running water to remove any chemical residue before inserting in patient's mouth.

Clean and heat sterilize heat-tolerant items used in the mouth including metal impression trays, air-water syringes, burs, rag wheels, lab knives, facebow forks, handpieces and instruments, polishing points, water bath basins. Clean and disinfect articulators, lathes, case pans, pressure pots, water baths, shade guide, rubber mixing bowls and torch between patients.

When taking or processing radiographs, wear gloves and other appropriate personal protective equipment as necessary. Heat sterilize heat-

tolerant radiographic accessories. Transport and handle exposed radiographs so as to prevent cross-contamination. Avoid contamination of developing equipment.

### c. Dental Unit Waterlines (DUWL), Biofilm, and Water Quality

Studies have shown that colonies of microorganisms, or biofilms, can form on the inside of the small-bore plastic tubing that transports water within the dental unit to handpieces and air-water syringes. Once formed, a biofilm serves as a reservoir that may dramatically increase the number of free-floating microorganisms in water used for dental treatment.

Most organisms isolated from dental water systems originate from the public water supply and do not pose a high risk of disease for healthy persons. Although a few pathogenic organisms, such as *Legionella* spp. and *Pseudomonas* sp., have been found, adverse public health threats have not been documented.

Examples of methods shown to be effective include the following:

- Self-contained water systems combined with intermittent or continuous chemical treatment.
- In-line microfilters.
- Combinations of these treatments.
- Another alternative is to bypass the conventional dental water delivery system entirely and use either autoclavable or disposable pathways, such as sterile water delivery systems.

During oral surgical procedures, microorganisms may enter the bloodstream and other normally sterile areas of the oral cavity (e.g., bone or

subcutaneous tissue). For this reason, sterile solutions (e.g., sterile saline or sterile water) should be used as a coolant/irrigator when performing surgical procedures.

Because the tubing cannot be reliably sterilized, conventional dental units cannot reliably deliver sterile water even when equipped with independent water reservoirs. Sterile water delivery devices, such as sterile irrigating syringes, or bulb syringes should be used to deliver sterile water. Sterile water systems, such as those used with surgical handpieces, bypass the dental unit and use sterile disposable or autoclavable tubing.

Any removable device that is attached to the air or waterlines should be heat sterilized to ensure that internal components have been sterilized.

It is very important to follow the manufacturer's instructions for cleaning and lubrication. These protocols can ensure the effectiveness of the process and contribute to the life of the device. Surface disinfection or liquid chemical germicide immersion are not acceptable.

Some parts of dental instruments are permanently attached to dental unit waterlines. These items do not enter the patient's mouth but are likely to become contaminated with oral fluids during treatment procedures. Some examples include handles or dental unit attachments of saliva ejectors, high-speed air evacuators, and air/water syringes. These components should be covered with waterproof barriers and changed after each use. If the item becomes visibly contaminated during use, clean and disinfect with an intermediate-level disinfectant before using it with the next patient.

A single-use device, also referred to as a disposable device, is intended for use on one patient. It was never intended to be cleaned, disinfected, or sterilized and used on another patient. Single-use devices used in dentistry are usually not heat tolerant and cannot be reliably cleaned.

Examples of such items include syringe needles, prophylaxis cups and brushes, and plastic orthodontic brackets.

**Oral Surgical Procedures**

The oral cavity is colonized by many types and large numbers of microorganisms. Surgical procedures present an opportunity for these microorganisms to enter the bloodstream and other normally sterile areas of the mouth. Entry of microorganisms into bone and subcutaneous tissue may increase the potential for localized or systemic infection.

CDC recommendations define oral surgical procedures as those that "involve the incision, excision, or reflection of tissue that exposes normally sterile areas of the oral cavity."

Examples include biopsy, periodontal surgery, implant surgery, apical surgery, and surgical extractions of teeth, defined as the removal of erupted or nonerupted teeth requiring elevation of mucoperiosteal flap, removal of bone, or sectioning of teeth and suturing if needed.

A higher level of infection control is warranted when performing surgical procedures and includes the following:

- Surgical handscrub using an antimicrobial agent.
- Use of sterile surgeon's gloves.
- Use of sterile irrigating solutions. The latter includes delivery systems that bypass the dental unit, such as sterile bulb syringes or sterile injection syringes.

**ADDITIONAL NEEDS IN DENTISTRY**

The dentist has a professional obligation to maintain the standards of practice of the profession and, accordingly, must ensure that infection control procedures are carried out in dental practice. Dental personnel recognize an obligation to maintain currency of knowledge of infection control procedures and to apply these procedures in the practice setting. Dental personnel should also accept a responsibility to contribute to public understanding of effective approaches to infection control.

Table 1. Sterilization and disinfection of dental instruments, materials, and some commonly used items

| Item | Steam Autoclave | Dry heat Oven | Chemical Vapor | Ethylene Oxide | Chemical Agents | Other methods/ comments |
|---|---|---|---|---|---|---|
| Angle attachments | + | + | + | ++ | + | |
| Burs | | | | | | |
| Carbon steel | - | ++ | ++ | ++ | - | Discard |
| Steel | + | ++ | ++ | ++ | - | Discard |
| Tungston-carbide | + | ++ | + | ++ | - | Discard |
| Condensers | ++ | ++ | ++ | ++ | + | |
| Dapen dishes | ++ | + | + | ++ | + | |
| Endodontic instruments (broaches, files, reamers) | ++ | ++ | ++ | ++ | - | |
| Stainless steel handles | + | ++ | ++ | ++ | + | |
| Steel + plastic handles | ++ | ++ | - | ++ | - | |
| Fluoride gel trays | | | | | | |
| Heat-resistant plastic | ++ | = | - | ++ | - | Discard (++) |
| Non heat-resistant plastic | = | = | - | ++ | - | Discard (++) |
| Glass slabs | ++ | ++ | ++ | ++ | + | |
| Hand instruments | | | | | | |
| Carbon steel | - | ++ | ++ | ++ | - | Steam autoclave with chemical protection (2% sodium nitrite) |
| Stainless steel | ++ | ++ | ++ | ++ | | |
| Handpieces * | (++)* | - | (+)* | ++ | | |
| Contra-angles | ++ | - | ++ | ++ | | |
| Prophylaxis angles* (disposable preferred) | + | + | + | + | | Discard (++) |
| Impression | | | | | | |
| Aluminium metal | ++ | + | ++ | ++ | - | |
| Chrome-plated | ++ | ++ | ++ | ++ | + | |
| Custom acrylic resin | = | = | = | ++ | | Discard (++) |
| plastic | = | = | = | ++ | + | Discard (++) |
| Instruments in packs | ++ | + Small packs | ++ | ++ Small packs | = | |
| Instrument tray setups | + | + | + | ++ | = | |

| Restorative/surgical | Size limit | | Size limit | Size limit | | |
|---|---|---|---|---|---|---|
| Mirrors | - | ++ | ++ | ++ | + | |
| Needles-disposable | = | = | = | = | = | Discard (++)<br>Do not reuse |
| Nitrous oxide | | | | | | |
| Nose piece | (++)* | = | (++)* | ++ | (+)* | |
| Hoses | (++)* | = | (++)* | ++ | (+)* | |
| Orthodontic pliers | | | | | | |
| High-quality stainless | ++ | ++ | ++ | ++ | - | |
| Low-quality stainless | - | ++ | ++ | ++ | - | |
| With plastic parts | = | = | = | ++ | + | |
| Pluggers & condensers | ++ | ++ | ++ | ++ | + | |
| Polishing wheels & disks | | | | | | |
| Garnet and cuttle | = | - | - | + | = | |
| Rag | ++ | - | + | ++ | = | |
| Rubber | + | - | - | ++ | - | |
| Removable prostheses | - | - | - | + | + | |
| Rubber dam equipment | | | | | | |
| Carbon steel clamps | - | ++ | ++ | ++ | - | |
| Metal frames | ++ | ++ | ++ | ++ | + | |
| Plastic frames | - | - | - | ++ | + | |
| Punches | - | ++ | ++ | ++ | + | |
| Stainless steel clamps | ++ | ++ | ++ | ++ | + | |
| Rubber items | | | | | | |
| Prophylaxis cups | - | - | - | ++ | - | Discard (++) |
| Saliva evacuators | - | - | - | - | | Discard (++) |
| Saliva ejectors (plastic) | | | | | | Single use |
| Stones | | | | | | |
| Diamond | + | ++ | ++ | ++ | - | |
| Polishing | ++ | + | ++ | ++ | - | |
| Sharpening | ++ | ++ | ++ | - | - | |
| Surgical instruments | | | | | | |
| Stainless steel | ++ | ++ | ++ | ++ | - | |
| Ultrasonic scaling tips | + | = | = | ++ | + | |
| Air-water syringe tips | ++ | ++ | ++ | ++ | - | Discard (++) |
| X-ray equipments | | | | | | |
| Plastic film holders | (++)* | = | (+)* | ++ | + | |
| Collimating devices | - | = | = | ++ | + | |

++ effective and preferred method

+ effective and acceptable method

- effective method, but risk of damage to materials

= ineffective method with risk of damage to materials

* since manufacturers use a variety of alloys and materials in these products, confirmation with the equipment manufacturers is recommended, especially for handpieces and their attachments

Table 2. Cleaning and disinfecting solutions available in Myanmar

| Name | Composition | Use |
|---|---|---|
| SEPTOL ASPIRATION Without Aldehyde[1] | - polyhexanide<br>- didecyldimethylammonium chloride<br>- detergent and scaling agents | It is especially adapted for cleaning and disinfecting aspiration circuits. It has an antimicrobial action and eliminates all organic or mineral deposits carried by aspiration systems. It is used diluted at 2%: put 20cc of solution (1 squirt o the pump) into a container. Fill up to 1 litre with water. Suck the solution in the circuit. Recommended contact time is 15 minutes. |
| SEPTOL INSTRUMENTS Without Aldehyde[1] | - Quaternary ammoniums<br>- Amphoteric surfactants<br>- Anti-corrosion agents<br>- Perfume | It is especially adapted for decontamination and cleaning of all instruments and medico-surgical equipments. It is used before sterilization. It is used diluted at 2%: put 20cc of solution (1 squirt o the pump) into a container. Fill up to 1 |

| | | |
|---|---|---|
| | | litre with water. The contact time is 15 minutes at room temperature. Rinsing instruments is mandatory. It can be used in an ultrasonic bath. |
| Coecide XL Sterilizing and disinfecting solution [2] | 2.5% alkaline glutaraldehyde | It disinfects immersed instruments in 20 minutes at 20°C-25°C and completely sterilizes in 10 hours at 25°C |

1. Silver Lotus
2. GC Dental

References

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