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## **Introduction:**

These infection control guidelines include appropriate procedures to protect dental patients as well as all dental health care workers (DHCW) whether employers or employees from occupational transmission of infectious diseases (including but not limited to bloodborne pathogens) in the dental office.

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## **1. Universal Precautions**

Universal precautions as defined by the Centers for Disease Control and Prevention (CDC) must be used in all patient care in dentistry. This term refers to a set of precautions designed to prevent transmission of human immunodeficiency virus (HIV), hepatitis B virus (HBV), and other bloodborne pathogens in health care settings. Under universal precautions, blood and saliva (in dentistry) of all patients are considered potentially infectious for HIV, HBV, and other bloodborne pathogens. Applied universal precautions means that the same infection control procedures for any given dental procedure must be used for all patients. Thus, the required infection control policies and procedures to be used for any given dental procedure are determined by the characteristics of the procedure. Therefore, universal precautions are procedure specific, not patient specific.

Universal precautions do not preclude the use of additional infection control procedures to protect a patient who is so severely medically compromised that these additional precautions are needed to provide for safe treatment of that patient. Patients with active Mycobacterium tuberculosis are an example of when infection control procedures beyond universal precautions may be required. Please refer to Section 13 and Appendix A of these Guidelines for information on tuberculosis.

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## **2. Hepatitis B Vaccination**

All DHCWs who have direct or indirect contact with patients' blood and/or saliva should be immunized with hepatitis B vaccine or show serological evidence of immunity (anti-HBs) to hepatitis B virus infection. The US Occupational Safety & Health Administration (OSHA) requires that the hepatitis B vaccine must be offered to employees at no charge within 10 days of employment. Those who receive the vaccine series should be serologically tested six weeks-six months after the third injection to determine if they have developed immunity. (This testing is not "required" by current OSHA regulations.) Those who have not developed immunity should be serologically evaluated to determine past exposure to HBV or possible need for additional hepatitis B immunizations. For adults and children with normal immune status, the antibody response to properly administered vaccine is excellent, and protection lasts for at least 10 years. Booster doses of vaccine are not routinely recommended, nor is routine serologic testing to assess antibody levels in vaccine recipients necessary during this period unless a person has a documented percutaneous, mucous membrane, or non-intact skin exposure to blood and/or

saliva. In these exposure incidents, the latest CDC guidelines should be followed to assess and manage the exposure.

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### **3. Percutaneous Injuries**

Percutaneous and permucosal exposure to the blood and other body fluids of dental patients poses the single greatest risk of transmission of HIV, hepatitis B, C and D, and other bloodborne diseases from patient to DHCW. Emphasis should be placed on prevention of these incidents by assessing safer devices and work practices. Review of the dental literature is also useful in determining which practices may be associated with dental exposure incidents.

In spite of efforts to prevent such injuries, every dental practice safety program should include preparation for response to these incidents. Post-exposure management as required by OSHA includes gathering information related to the exposure, offering medical follow-up to the exposed worker, and requesting that the source patient be tested for HIV and hepatitis B and C. It is imperative that the post-exposure management program be in place before an incident occurs. Delay in referral to a qualified medical practitioner in assessing the injury may affect the availability of prophylactic medications that can now be offered to exposed health care workers.

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### **4. Mouth Rinses**

A pre-procedure mouth rinse should be used to reduce the number of microbes in the patient's mouth. The mouth rinse should have residual activity to help maintain reduced microbial levels throughout the appointment.

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### **5. Handwashing and Hand Care**

The skin of DHCWs' hands harbor resident and transient microorganisms. Most resident microorganisms found in the superficial layers of the skin are not highly virulent, but may be responsible for some skin infections. DHCW contact with infected patients is a source of transient microorganisms on DHCWs' hands. Transient microorganisms pose the greatest risk of cross-infection. Adequate handwashing will remove or inhibit both transient and resident organisms.

DHCWs should wash hands before donning gloves, upon removal of gloves, and after inadvertent barehanded touching of contaminated surfaces or objects.

For most routine procedures, washing with plain soap appears adequate. Use antimicrobial soap for more invasive procedures, such as surgery. For all handwashing, convenient placement of sinks, towels, and soaps will encourage use by workers. When possible, use alternative sink controls such as foot or sensor-activated faucets. Vigorously rubbing lathered hands together under a stream of water for a minimum of ten seconds is adequate for routine handwashing. Thorough rinsing under a stream of water should follow this. Dry hands well before donning gloves. DHCWs with open sores or weeping dermatitis must refrain from direct patient contact and handling of patient care equipment until the condition is resolved.

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## 6. Personal Protective Equipment (PPE)

DHCWs must wear protective attire such as eye wear or a chin-length shield, disposable gloves, a disposable surgical quality mask, and protective clothing when performing procedures capable of causing splash, spatter, or other contact with body fluids, and/or mucous membranes. Protective attire must also be worn when touching items or surfaces that may be contaminated with these fluids, and during other activities that pose a risk of exposure to blood, saliva or tissue.

Dental clinical personnel must wear protective attire such as eye wear or a chin-length shield, disposable gloves, a disposable surgical quality mask, and protective clothing when performing procedures capable of causing splash, spatter, contact with body fluids, mucous membranes, or touching items or surfaces that may be contaminated with these fluids. Protective attire also must be worn during other activities that require handling items contaminated with patient secretions that create a potential for exposure to blood, saliva or tissue.

**Gloves** are single use items and must not be reused. Single use gloves may not be washed, disinfected or sterilized. They may be rinsed with water only to remove excess powder. Torn or compromised gloves must be replaced immediately. Latex, vinyl or other disposable medical quality gloves may be used for patient exams and procedures. Plastic or foodhandlers' gloves may be worn over contaminated treatment gloves (overgloving) to prevent contamination of clean objects handled during treatment. These overgloves may never be used alone as a hand barrier, or for intraoral patient care procedures. Overgloves must be handled carefully to avoid contamination during handling with contaminated procedure gloves. If overgloves are not used, contaminated procedure gloves should be removed before leaving chairside during patient care and replaced with new gloves upon returning to patient care. Hands must be washed after glove removal and before re-gloving.

**Surgical masks** that have at least 95% filtration efficiency for particles 3-5 micron in diameter must be worn whenever splash or spatter is anticipated. Masks should be changed for every patient or more often, particularly if heavy spatter is generated during treatment. Some literature suggests masks should be worn a maximum of 20 minutes in areas of high humidity, and a maximum of 60 minutes in dry climates. Masks should be handled by touching the periphery only, avoiding handling of the body of the mask. Masks should not contact the mouth while being worn as the moisture generated will decrease the mask filtration efficiency. A mask should be selected that conforms well to the shape of the face. A faceshield does not substitute for a surgical mask.

**Protective eye wear** must have solid side-shields and be decontaminated by immersion in a cleaning agent between patients. A faceshield may substitute for protective eye wear. If protective eyewear or a faceshield is used to protect against damage from solid projectiles, the protective eyewear should meet American National Standards Institute (ANSI) Occupational and Educational Eye and Face Protection Standard (Z87.1-1989) and be clearly marked as such.

**Protective clothing** must have a high neck and protect the arms if splash and spatter are reasonably anticipated. Cotton or cotton/polyester or disposable clinic jackets or lab coats are usually satisfactory attire for routine dental procedures. The type and characteristics of protective clothing depend on the type of exposure anticipated. Gowns or jackets worn as protective attire should be changed at least daily, or more often if visibly soiled. Protective gowns or covers must be removed before leaving the work area. Protective attire may not be taken home and washed by employees. It may be laundered in the office if equipment is available and universal precautions are followed for handling and laundering contaminated attire. Contaminated linens transported away from the office for laundering should be in appropriate bags to prevent leaking, with a biohazard label or appropriately color-coded, unless the laundry facility employees practice

universal precautions in the handling of all laundry. Disposable gowns may be used but must be discarded daily, or more often if visibly soiled.

**Utility gloves** that are puncture-resistant, a mask, protective clothing and protective eyewear must be worn when handling and cleaning contaminated instruments, when performing operatory cleanup, and for surface cleaning and disinfecting. Utility gloves must be discarded if their barrier properties become compromised. Utility gloves, protective eye wear or face shields, and masks must be worn when mixing and/or using chemical sterilants or disinfectants. Used utility gloves must be considered contaminated and handled appropriately until properly disinfected or sterilized.

**NOTE:** Along with the increased use of latex gloves for infection control purposes has been an increased incidence of latex allergies and other sensitivities. Certain individuals are considered to be at an increased risk of latex sensitivity. These individuals include persons who have had multiple surgeries (especially involving the placement of rubber tubes or drains), spina bifida patients, health care workers, and individuals with other documented allergies. Medical histories should include questions which may alert the DHCW that a patient is latex-sensitive. If a person is found to be sensitive to latex, precautions such as non-latex gloves, non-latex rubber dams, and avoidance of any other latex-containing products should be implemented in the treatment of those patients. Latex-sensitive patients should also be scheduled at the beginning of the day to minimize exposure to latex residue and powder.

DHCWs who experience symptoms consistent with sensitivity including skin rash, itching, or wheezing should seek the advice of a qualified medical professional for diagnosis of the symptoms. Because a variety of materials may be responsible for the sensitivity, including resin materials which may permeate the gloves, self-diagnosis is ill-advised and could increase the risk of a serious allergic response.

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## 7. Instrument Sterilization

Puncture-resistant utility gloves, a mask, protective eyewear, and a protective gown or apron must be worn throughout instrument processing.

Single use disposable items must be disposed after each use. All reusable items that come in contact with the patient's blood, saliva or mucous membranes must be sterilized in an autoclave, unsaturated chemical vapor sterilizer, dry heat sterilizer (must be FDA-cleared for use as a medical device), or ethylene oxide gas sterilizer before reuse. Ethylene oxide is inappropriate for use with lubricated items such as handpieces, due to failure of the gas to penetrate lubricants.

Sterilization by immersion in a chemical sterilant which has been FDA-cleared for use as a sterilizing agent is only appropriate for those items which may be damaged by the sterilization methods referred to in the paragraph above. Use the concentration, contact time, and temperature stated on the product label to achieve chemical sterilization. The solution should be routinely checked during use with a glutaraldehyde indicator to assure a minimum effective glutaraldehyde concentration. Note that glutaraldehyde cannot be biologically monitored to verify sterilization, nor can items be packaged prior to chemical sterilization.

The procedure for processing reusable instruments begins at chairside. It is important to keep instruments moist to facilitate cleaning. Therefore, if instruments are not immediately processed, they should be placed in a "holding" solution (soapy water or a commercially available surfactant solution) to prevent the drying of blood and debris. All items must be properly cleaned in an ultrasonic cleaning unit or instrument washer. Only cleaners intended for use in an ultrasonic

cleaner or instrument washer should be used. Chemical germicides are inappropriate for use with these devices. Hand scrubbing of sharp instruments should be avoided. However, if hand scrubbing or cleaning is required, use a clean long-handled brush and keep instruments submerged while scrubbing to reduce spatter. Brushes should be disposable or autoclavable. Care must be taken to avoid injuries with hand (brush) scrubbing. Instruments must be dry if ethylene oxide gas, dry heat, or unsaturated chemical vapor sterilizers are used. Instruments must be packaged (using proper pouches, bags or wrapped cassettes or packs) before steam, chemical vapor, dry heat or gas sterilization and remain packaged for storage to protect the items from environmental contamination after sterilization. Mark packages with date and sterilizer number for tracking purposes. Note: Do not write with ink directly on paper (wrap or pouches). Autoclave tape, bar code stickers, or writing on plastic side of pouches is acceptable.

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## **8. Handpiece Sterilization**

All high-speed handpieces, nose cones, contra-angles, low-speed motors, motor-to-angle adapters and prophylaxis angles (unless disposable prophylaxis angles are used) must be heat sterilized between patients. The cleaning, sterilization and maintenance procedures described by the handpiece manufacturer must be meticulously followed to ensure proper sterilization and maximum longevity from the handpiece.

After patient treatment, flush the water/air lines for 20-30 seconds with the high speed handpieces still attached. Remove the handpieces and thoroughly clean the external/internal surfaces as directed. Package before sterilization, and process through the sterilizer according to the sterilizer and handpiece manufacturers' instructions. If lubrication is indicated by the handpiece manufacturer either before or after sterilization, follow the procedures as outlined by the manufacturer. It is recommended that a separate container of lubricant be reserved for this purpose as a cross-contamination avoidance strategy.

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## **9. Sterilization Monitoring**

The use and functioning of heat sterilizers should be biologically monitored at least weekly, or more often if the practice demands it, with appropriate spore tests. Place the spore strips or vials inside a pouch, bag, pack or cassette, and include this package as part of the normal load through a normal sterilizer cycle. Always use a control spore strip or vial (not heat processed but otherwise treated identically to the test strips or vials) with each spore test performed. Additionally, chemical indicators should be used on the inside of each package during every sterilizer load. Accurate records of sterilization monitoring must be maintained. A chemical indicator from inside each pack may be initialed and dated for each day of patient care and kept in a file. The weekly spore test for each heat sterilization unit may be kept in the same file. Biologically monitor whenever there is a change in packaging, following equipment repair; retest after failure and when training new employees.

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## **10. Environmental Surface and Equipment Asepsis**

Current CDC Guidelines recommend that all waterlines for syringes and/or handpieces should be turned on and flushed for several minutes with handpieces disconnected at the beginning of the day and 20-30 seconds between patients. However, research has shown this protocol alone to be temporary and inadequate in controlling water contamination.

Sterile cooling and irrigating solutions must be used as an irrigant during surgical procedures. This water must be delivered from a source separate from the dental unit. Dental unit water which contains fewer than 200 CFU/ml of heterotrophic mesophilic bacteria is acceptable for use as a coolant or irrigant for all non-surgical dental procedures. Dental water delivery systems which are fitted with anti-retraction valves must be checked weekly. Alternatively, systems which provide constant positive pressure may be used. Heat sterilized or disposable air/water syringe tips and vacuum tips must be used. All vacuum lines must be flushed after every patient procedure to prevent drying of blood and debris in the lines.

To develop an effective asepsis protocol, operatory surfaces including walls, floors, cabinetry and equipment should be classified and managed under three categories: touch surfaces, transfer surfaces and splash/spatter surfaces.

**a) Touch Surfaces:**

Surfaces that are usually touched and contaminated during dental procedures. Examples include dental light handles, dental unit handle and controls, headrest adjustment mechanisms, or dental chair switches.

Touch surfaces should be kept at a minimum. If a surface must or might be touched, it should be cleaned and disinfected, or covered with a barrier that is impervious to liquid. Barriers must be single-use and replaced between patients. Offices should develop a standard procedure for installing and removing barriers that will prevent cross contamination. All office staff responsible for operatory turnover between patients should be trained in this standard procedure. Contaminated barriers must be properly discarded. If a covered touch surface is compromised and becomes visibly contaminated, it should be cleaned and disinfected with an low or intermediate-level disinfectant before applying the barriers for the next patient. Touch surfaces that have been covered with barriers should be cleaned and disinfected at the end of each clinical day. Before the first patient of the next clinical day, new barriers should be installed.

**b) Transfer Surfaces:** Surfaces that are not touched, but which are usually contacted by contaminated instruments. Examples include instrument trays and dental unit handpiece holders. Asepsis for transfer surfaces is the same as for touch surfaces.

**c) Splash, Splatter and Aerosol Surfaces:** All surfaces in the operatory other than touch or transfer surfaces. Splash and spatter surfaces need not be disinfected, but should be cleaned (at least daily, or more often if possible).

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## 11. Laboratory Asepsis

Open communication must exist between the dental office and the dental laboratory concerning infection control protocols and delineation of responsibilities between the office and lab.

Materials, impressions and intra-oral appliances must be cleaned and disinfected before being handled, adjusted, or sent to a dental lab. Personal protective equipment including gown, gloves, mask and protective eyewear should be worn.

Before selecting a disinfecting agent, consult the manufacturers of specific materials as to the stability of their material relative to disinfection agents and procedures. Then, disinfect for the specified length of time with the appropriate chemical (1:10 sodium hypochlorite solution or an EPA-registered, tuberculocidal disinfectant that also kills hydrophilic and lipophilic (enveloped and

nonenveloped) viruses). Finally, rinse thoroughly. Do not transfer to laboratory in container containing disinfectant.

If items are properly disinfected before being taken into or sent out to the laboratory, then lab equipment and surfaces should not become contaminated. However, a laboratory that provides services to numerous clients may become subject to contamination from other sources. All items returned from a commercial laboratory should be considered clean for handling but should be disinfected before placing in a patients' mouth. If laboratory equipment, surfaces and attachments become contaminated with blood or saliva, they must be thoroughly cleaned and then sterilized or disinfected before use on another case.

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## 12. Waste Disposal

**a. General:** All waste must be disposed according to applicable federal, state and local regulations and recommendations. Generally, blood and /or saliva-tinged items are not regulated waste. Hard and soft tissue and soaked items, that is, blood or saliva can be squeezed out, or blood may flake from the item, are considered regulated medical waste. Always consult the state or local government agency regarding specific exemptions and disposal/treatment requirements..

**b. Infectious Disease Hazard (Biohazard) Communication:** Containers of regulated medical waste (as defined above) are to be labeled and/or identified in compliance with local regulations. These containers include contaminated sharps containers, contaminated reusable sharps containers (i.e., pans used for holding contaminated instruments), bags of contaminated laundry, specimen containers, and storage containers.

**c. Handling and disposing sharps:** Place needles and other disposable sharps, such as scalpel blades, orthodontic wires and broken glass into a puncture resistant, leak-proof container that is closable and color-coded or labeled with the biohazard symbol. The container must be located as close as possible to the point of use for immediate disposal. Do not cut, bend, break or remove needles by hand before disposal, and do not remove needles from disposable syringes.

To recap a needle on a non-disposable anesthetic syringe, lay the needle cover on a firm surface and guide the needle into the cover using only one hand; OR use one-handed resheathing with a resheathing device. Alternatively, self-sheathing needles may also be used. If the device is one that is hand-held, it must provide full hand protection for the hand holding the device. When the sharps container is 3/4 full, securely close and treat or dispose according to state and local laws.

**d. Non-sharp disposable items:** Non-sharp disposable items that are considered regulated waste by state or local laws must be disposed of and/or transported according to specific state and/or local regulations. At a minimum, these items must always be placed in labeled, leak-proof bags or containers. Disposable items that may contain the body fluids of patients, but are not subject to medical waste regulations, such as gloves and patient bibs, should be placed in a lined trash receptacle. Red bags should not be used for non-regulated waste. Check the specific requirements of the local regulatory agency (usually state or county health departments).

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## 13. Tuberculosis

With the reemergence of Mycobacterium tuberculosis (TB) infection and active tuberculosis as demonstrated risk factors for health care workers (HCW), consult the following reference

"Guidelines for Preventing the Transmission of TB in Health Care Facilities, 1994," CDC. (appendix A)

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## 14. Training

All DHCWs involved in the direct provision of patient care should receive regular training in infection control and safety issues. Training should include coverage of OSHA's pertinent regulations such as the Bloodborne Pathogens and Hazard Communication standards.

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## 15. Other

**a. A dental dam and high volume evacuation** may be used during dental procedures, when indicated, to minimize the amount of potentially contaminated splash and spatter, and to minimize direct contact with patients' oral mucosa.

**b. Ventilation devices** such as a one-way CPR airway (e.g., a pocket mask with a one-way valve) or oxygen with bagging capability must be available for those qualified to provide such care.

**c. Eating, Drinking, Smoking:** Do not eat, drink, smoke, apply cosmetics or lip balm, handle contact lenses or store food or drink in areas of possible exposure to (or storage of) blood, saliva, tissue or other potentially infectious materials. This would include the dental operatory, dental laboratory, sterilization area and darkroom/x-ray processing area.

**d. Decontamination of Equipment for Servicing or Maintenance:** Contaminated equipment or instruments that are to be repaired on site or shipped for service are first to be cleaned and sterilized or disinfected. If a portion of the equipment cannot be cleaned and sterilized or disinfected, that portion should be identified with a biohazard label and an explanation to those who may handle the contaminated item. Utility gloves, masks and protective eyewear must be worn when routine maintenance is performed on equipment such as replacing filters on suction pumps, etc. Infection control practices/procedures should be communicated to the repair personnel.

**e. Radiographic Asepsis:** Wear gloves while exposing films in the patient's mouth. Place exposed films in a paper cup. When all films are exposed, remove and discard gloves. Reglove and transport to the darkroom, carefully open the packs and drop the films on a clean surface. Discard the contaminated wrappers, remove and discard the gloves, and process the films.

**Daylight loader:** When using an x-ray processor with a daylight loader, extra precautions are required to avoid contamination of the sleeves, and external and internal components of the processor. Place films in a paper cup as they are exposed. When all the films have been taken, remove gloves and place the paper cup containing exposed film packets into the daylight loader. Wearing clean gloves, insert hands through the sleeves of daylight loader. Open all film packets, allowing films to drop onto a clean surface. Do not touch films with gloved hands. Once all the film packets have been opened, discard empty film wrappers, remove gloves and process films with bare hands. For disposal, empty film packets and used gloves may be placed in the paper cup that was originally used to transport films into the daylight loader. If the insides of the insertion sleeves have ever been contaminated, double gloving may be used for protection when removing

hands from the daylight loader. One pair of gloves should be removed after opening film packets, leaving a clean pair of gloves for handling films and touching the sleeves of the daylight loader.

**Barrier Pack Films:** X-ray films packaged in fluid impervious barriers are available. A slight modification of the recommended x-ray and darkroom protocol is indicated. After exposing the film, pull on the edges of the barrier pack, allowing the film to drop into a clean paper cup without contaminating the inner film packet. When all films have been exposed and collected in the cup, remove procedure gloves and take films to the darkroom or daylight loader for processing.

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## DISCLAIMER

The Organization for Safety & Asepsis Procedures' (OSAP) Infection Control in Dentistry Guidelines updated in September, 1997 are based on the recommendations of the Centers for Disease Control and Prevention and other publications in the dental and medical literature. The guidelines here are intended to offer general guidance on infection control. OSAP assumes no responsibility for actions taken based on the information herein.



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Appendix A

**POLICY FOR TREATMENT OF DENTAL PATIENTS WITH ACTIVE OR SUSPECTED  
INFECTION WITH TUBERCULOSIS**

- A. During initial medical history and periodic updates ask patients about a history of TB disease and symptoms suggestive of TB. Symptoms include chronic cough, coughing blood, night sweats, and weight loss. **Note:** positive TB skin test without symptoms does not indicate **active infection** in most cases.
- B. Patients with history and symptoms suggestive of active TB should be promptly referred to a physician for evaluation for possible infectiousness.
- C. Elective dental treatment should be postponed until a physician confirms, using recognized diagnostic evaluations, that the patient does not have active tuberculosis.
- D. If urgent dental care must be provided for a patient who has, or is suspected of having, active TB infection, TB isolation practices must be implemented. Treatment provided should be limited to the minimal necessary to relieve the patient's immediate pain. Generally, referral to a medical center with proper isolation rooms will be required. Respiratory protection (HEPA-filter masks) must be used by the dental care providers when performing procedures on these patients. The respirators must be fit tested prior to each use.
- E. DHCWs with persistent cough and other symptoms suggestive of active TB should be evaluated promptly for TB. The individual should not return to work until a diagnosis of TB has been excluded or until the individual is on therapy and a determination has been made that the worker is not infectious.

from:

**Centers for Disease Control and Prevention  
Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health Care  
Facilities, 1994.**