INFECTION CONTROL

GUIDELINES IN DENTAL PRACTICE

2012

2nd Edition

Prepared by:
Superintendent of Infection Control
& Quality in Dental Services

Ministry Of Health
Kuwait

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Acknowledgement

These guidelines have been written for healthcare workers in dental practice in Kuwait, whether working for the Ministry of Health or Private Practice.
These guidelines give more information on infection control specific to care give in the dental practice.
The purpose of this booklet is to encourage individual responsibility by every member of staff. All should participate in the prevention and control of infection within the dental practice.

I am proud to present this booklet with a great respect and appreciation to the efforts and expertise of **Dr. Ghaneema Al-Dakhil**, the Superintendent for infection control and quality assurance and her co-workers.

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Preface

Infection control is a part of every dental professional's daily practice. In this booklet, I have offered very simple and effective guidelines for daily use to reduce infection without loss of clinical time. I have included also some generic protocols that can be easily modified according to the needs of each particular clinical setting.

I hope that this booklet will ensure our dental professionals have safe and practical working environment that is free from infection.

I extend my thanks and appreciation to the superintendent's team and I hope all dental personnel may strictly hold on to these guidelines for the best of all.

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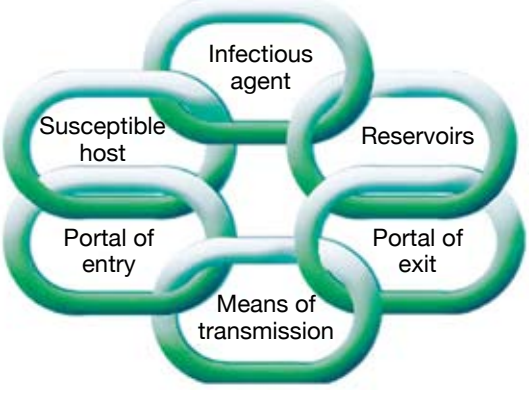
INTRODUCTION

The nature of many dental procedures can place dental team members and patients in close contact with potential pathogens, especially those found in blood. Diseases can be transmitted from the patient to the dental worker, from the dental worker to the patient, or from one patient to another. In the dental setting, possible modes of transmission include:

- direct contact with blood, oral fluids, or other patient materials;
- indirect contact with contaminated objects (such as instruments, equipment, environmental surfaces, or a team member's contaminated hands);
- droplet contact, in which spray or spatter containing microorganisms travels a short distance before settling on the mucous membranes of the eyes, nose, or mouth;
- inhalation of evaporated microorganisms ("droplet nuclei") that can remain airborne for extended periods of time as aerosols.

For a disease to be transmitted, a number of conditions must be met, referred to as the "chain of infection".

Infection control involves breaking one or more links in the chain. This infection control guideline is planned and designed to include appropriate procedures to help break the links in the chain and protect dental patient as well as dental health care workers(DHCWs) from occupational transmission of infectious diseases.



STANDARD PRECAUTIONS:

Standard precautions expands the idea of which fluids are considered infectious. standard precautions guard against exposure to all body fluids, secretions, and excretions, regardless of whether they contain blood. (The exception is sweat, which is not infectious.)

Standard precautions are the basic processes of infection control which will prevent the transmission of infection and include:

- Vaccines for dental healthcare workers: All DHCW'S who have direct or indirect contact with patient's blood and/ or saliva should be immunized with hepatitis B vaccine or show serological evidence of immunity (anti-HBs) to hepatitis B virus infection. DHCW's are also at risk of exposure to possible transmission of other vaccine-preventable diseases; accordingly, vaccination against influenza, measles, mumps, rubella, and tetanus may be appropriate for them (Appendix 1).
- Regular hand hygiene before and after patient contact.
- Use, where appropriate, of personal protective barriers such as gloves, masks, eye protection and gowns.
- Use, where appropriate, of environmental barriers such as plastic coverings on chair headrests and difficult to clean areas such as triple syringe buttons
- Wearing of appropriate protective equipment when cleaning instruments
- Appropriate handling of contaminated waste
- Appropriate handling of sharps
- Appropriate reprocessing of reusable instruments
- Effective environmental cleaning; and
- Appropriate management of spills of potentially infectious matter.

Patient medical history is also taken as a standard precaution

1. A thorough medical history should be taken for all new patients.
2. Patients with suspected infectious disease should be screened to identify the disease.
3. Review and update patients medical history at each appointment.
4. According to medical history, record notes for special requirements(e.g., premedication).

Hand hygiene

The skin of DHCWs, hands harbor resident and transient micro-organisms. Most resident microorganisms found in the superficial layers of the skin are not highly virulent, but may be responsible for some skin infections. Transient micro-organisms are acquired by contact with patients, instruments and environment, they pose the greatest risk of cross-infection.

Classification of hand washing

Hand washing can be classified according to the type, intensity and duration of activity .
The types of hand washing recognized in infection control practice are:

The three types of hand washing

Type	Product	Duration (Entire procedure)	Purpose
Social Hand Washing	Soap and water	20-30 seconds	Removal of dirt, body fluids and transient microorganism
Clinical hand hygiene	Aqueous antimicrobial disinfectant alcohol hand rub	20-30 seconds 20-30 seconds	Killing and removal of transient microbes and reduction of resident flora
Surgical hand hygiene	Aqueous antimicrobial disinfectant alcohol hand rub	2 minutes	Killing and removal of transient microorganism and substantially reduction of resident microorganisms

Indications of hygienic hand washing:

1. Before and after treating each patient.
2. Prior to wearing gloves.
3. After removing protective equipment such as gloves, gowns,etc.
4. After touching objects likely to be contaminated by blood, saliva or respiratory secretions.
5. Before leaving the work place.

Technique of hand washing:

The recommended hand washing technique depends on the purpose of the hand washing . Nails should be short enough to allow thorough cleaning underneath them, and not cause glove tears. The hands including nails and surrounding tissues should be inflammation free. Artificial nails and nail polish should be avoided because they may harbor some germs like fungi underneath them, and they may discourage vigorous hand washing. Rings should be removed during hand washing. (Appendix 2)

Hand washing steps:

Hand washing with Combination of soap and disinfectant are effective.
(Bar soap should never be used as it can get heavily contaminated and can grow bacteria!)

1. washing procedure take 20-30 seconds.
2. Wet hands under lukewarm running water before applying liquid soap or antiseptic hand wash solution into cupped hands. Use enough soap/antiseptic solution to cover the hands completely.
3. Rub hands together vigorously to lather all surfaces of hands and wrists.
4. Wash palms, backs of hands , fingers and thumb webs, tips of fingers and thumbs, especially the nail area.
5. Rinse hands thoroughly under running water.
6. Dry hands completely with a soft, absorbent single-use disposable paper towel.
7. Use the disposable towel to turn off the tap.
8. Cloth towels are not recommended in health care settings because of concerns regarding contamination.
9. Air dryers are also not recommended in health care settings, they take longer time to dry hands, serve only one person at a time, cause air disposal of germs, cause dryness of hands and need maintenance.
10. Emollient hand cream applied several times a day help to prevent skin problems from developing.

Surgical hand washing:

For surgical producers (e.g. implant surgery), more extensive disinfection of the hands (antisepsis) is required in order to reduce the numbers of resident bacteria to minimum.
First, clean the nail and wash the hands and forearms with an antimicrobial disinfectant hand wash solution for 2 minutes, followed by thorough rinsing and drying of the skin.

Personal Protective Equipment:(PPE)

DHCW's must wear protective coverings, such as eye glasses or chin-length face shield, disposable gloves, masks and protective clothing when performing procedures during which splash / spatter is anticipated. Also must be worn in case of contact with body fluids(blood, saliva),tissues, mucous membranes or touching items or surfaces that may be contaminated with these fluids. Sequence of donning and removing PPE can be seen in (Appendix 3) respectively.

1- Gloves:

These are disposable items and must not be washed, disinfected or sterilized for re-use. Torn gloves must be replaced immediately.

Gloves used in dental practice:

a- Non sterile gloves: used for patient examination and non-sterile procedures.
b- Sterile gloves: used for all types of surgical procedures including simple tooth extraction.
c- Over gloves: These are plastic or food handler's gloves which are worn over contaminated examination non-sterile gloves(over gloving) to prevent contamination of clean objects handled during treatment. These gloves should never be used alone as a hand barrier, or for intra-oral patient care procedures.
If over-gloves are not used, contaminated procedure gloves should be removed before leaving chair side during patient care for doing certain tasks such as using phones, writing prescriptions or opening drawers.

New gloves should be worn upon returning to patient care. Hands must be washed after removing the gloves and before re-gloving.

Contact Dermatitis and Latex Hypersensitivity:

- Educate DHCW's regarding the signs, symptoms, and diagnoses of skin reactions associated with frequent hand hygiene and glove use.
- Screen all patients for latex allergy (e.g., take health history and refer for medical consultation when latex allergy is suspected) .
- Ensure a latex-safe environment for patients and DHCW with latex allergy
- Have emergency treatment kits with latex-free products available at all times

2- Masks:

Wear a mask or a face shield to protect mucous membranes of the eyes, nose, and mouth whenever splash and spatter is anticipated. Surgical masks that have at least 95% filtration efficiency must be worn when surgical procedures are performed.
Masks should be handled by touching the periphery only, avoid handling the body of the mask. Masks should not contact the mouth while being worn as the moisture generated will decrease the mask filtration efficiency. Masks should be changed whenever they get moistened.

3- Eye wear & face shield:

Wear protective eyewear/ goggles /face shields to protect the mucous membranes of the eyes during procedures where there is the potential for penetrating injury or exposure to aerosols, splattering or spraying with blood, saliva or body substances. This includes most clinical procedures, especially during scaling, the use of rotary instruments,

the cutting and use of wires and during the cleaning of instruments and equipment. Eyewear must be optically clear, anti-fog, distortion-free, close-fitting and shielded at the sides.
If disposable, discard appropriately. If they are reusable, decontaminate them according to the manufacturer's instructions.
A face shield does not substitute for surgical mask.

4- Protective clothing:

a- A clean non-sterile gown

A clean gown with a high neck and long sleeves is adequate to protect skin and prevent soiling of clothing during procedures and patient care activities that are likely to generate splashes or spatters of blood or body fluids. Protective gowns should be changed daily or more often if visibly soiled. Protective gowns must be removed before leaving the work area. Disposable gowns if used must be discarded daily, or more often if visibly soiled.

b- Sterile gown

Sterile gown that have a high neck & long sleeves made of material that can be sterilized e.g., linen or sterile disposable paper gown should be used in theater, and during surgical procedures in the clinic.

c- Caps and boots/shoe covers

Wear disposable caps and boots where there is a likelihood the patient's blood, body fluids, secretions or excretions may splash, spill or leak onto the hair or shoes. Do not reuse disposable caps. Decontaminate reusable boots. Discard boots/shoe covers after use.

Environmental surface and Equipment asepsis:

Dental water delivery system:

Dental water delivery systems that are fitted with anti-retraction valves are recommended. Those provided with constant positive pressure may be used.
Filtered distilled water should be used for the dental unit and it is acceptable for use as a coolant or irrigant for all non-surgical dental procedures.
Heat sterilized or disposable air/water syringe tips and vacuum tips must be used. Sterile irrigating solutions must be used as an irrigant during surgical procedures. This water must be delivered from a source separate from the dental unit.

Water & Vacuum lines:

All water lines for syringes and/or hand pieces should be turned on and flushed for several minutes, once with hand-pieces disconnected and then with connected hand-pieces, at the beginning of the day and 20-30 seconds between patients.
All vacuum lines must be flushed by appropriate antiseptic solution after every patient procedure to prevent drying of blood and debris in the lines.

Working surfaces:

Surfaces that are usually contaminated during dental procedures,(e.g., dental light handles, dental unit handle and control, headrest adjustment control, instrument trays, dental unit hand-piece holders), should be cleaned and disinfected using high level disinfectant in between patients and at the end of each clinical day .
Disposable barriers can be used in between patients and contaminated barriers must be properly discarded. If a surface becomes visibly contaminated, it should be cleaned and disinfected with high level disinfectant before applying the barriers for the next patient. Covering working surfaces with non-sterile covering is prohibited. All surfaces should be

cleaned and disinfected at the end of each clinical day. Non-contaminated surfaces should be cleaned vigorously with detergent and water daily.

Splashes & spatter:

To minimize the potentially contaminated splash and spatter generated during dental procedures, a dental dam, high volume evacuation and proper patient positioning may be used during patients treatment.

Infection control guidelines for dental labs:

1. 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.
2. Hand hygiene should be practiced after each case and at the end of the day, before leaving the lab.
3. Personal protective attire should always be worn, when in the lab.
4. Materials, impressions and intra-oral appliances must be cleaned and disinfected before being handled or adjusted. They should be put in sealed bags before sending to a dental lab.
5. All impressions should be washed under running water before and after disinfection. Gloves should be changed after disinfecting the impressions.
6. 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.
7. Ultrasonic cleaning machine can be used to clean bridges and dentures before sending them to the clinic.
8. Dentures, bridges and impressions should be placed inside sealed bags after disinfection and before sending it to the clinic.
9. Sinks and working surfaces should be disinfected daily by Presept or Actichlor.
10. It's preferable to use the latest types of plaster which have antibacterial additives.

11. To avoid cross infection, disinfectant solution can be added to pumice, such as:
    a- 10% Iodophors solution
    b- 1% Hypochlorite solution (Presept)
12. Metal knives and spatulas should be sent to the sterilization room daily, to be sterilized by heat.
13. Eating and drinking is prohibited inside the lab.

Impression trays:

1. Autoclavable trays: After use, should be sent to the sterilization room for sterilization
2. Non autoclavable trays (heat sensitive, disposable): Should be disposed in the yellow waste bags as soon as the impression is poured and should not be re-used.

Dental lab wastes:

1- Special acrylic or shellac base trays:
Special trays are considered to be a great source of cross infection. They should be disposed in the yellow labeled waste bags after removing the poured impression.

2- Impression bags:
The bags that cover the impressions during transportation from the clinic to the lab are hazardous. Lab technician should dispose it directly in the yellow labeled waste bags right after taking the impression out of it.

Infection control guidelines for dental Radiology:

1. X-ray technicians are subjected to cross-infection just like dentists.
2. Disposable gloves should be worn during the procedures and changed between each patient. These gloves should be disposed of prior to developing films.
3. Disposable x-ray film holders should be used, preferably. Film packets, plastic wraps, and disposable x-ray film holders should be disposed off immediately after each patient by placing them in the yellow labeled waste bags.
4. Disinfect the headrest of the chairs, x-ray heads and extension cones after each patient or use disposable plastic covers.
5. Precautions should be taken while removing the film from the patient mouth and transporting it to the dark room. The chance of transmitting infection during this procedure is high.
6. The films should be directly placed in a disposable cup or tray, then covered by a tissue paper and transported to the dark room. Dispose this tissue paper, cup or tray in the yellow garbage, reusable trays should be sterilized.
7. Put disposable cover over a designated area in the dark room, on which films should be set. The person developing the films should be wearing clean gloves.
8. All film packets can be opened, gloves discarded and hands washed, before the films are picked up for placement in the developer.

Panoramic units:

1. Plastic covers for the bite pieces can be used in panoramic units.
2. If covers are not used, proper cleaning and disinfection of the bite blocks between patients is required.
3. All extension cones and head positioning guide of the panoramic unit should be cleaned and disinfected by disinfectant wipes. The wipes available can be used both for cleaning and disinfecting. Appendix 4

Waste disposal:

Dental waste is considered as a part of medical waste, therefore should be handled and treated according to the Ministry policy for management of medical waste. This waste is divided into:

1- Infectious waste:

A- Sharp items:

- Place needles and other disposable sharps, such as scalpel blades, orthodontic wires and broken glass into a puncture resistant, leak proof container that can be closed and color-coded or labeled with the biohazard symbol(the yellow containers).
- 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. When the sharps container is ¾ full, securely close and treat or dispose off according to Ministry regulations.
- 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 (Appendix 5&6). Alternatively, self-sheathing needles may also be used.

B- Non-sharp items:

Disposable items that may contain blood or other body fluid of the patients such as gloves, patient bibs and rubber-dam should be placed in sealed, sturdy impervious bags to prevent leakage of the contained items (the yellow labeled plastic bags), and disposed according to ministry regulations.

2- Non-infectious and non-hazardous waste ,such as paper tissues

(disposable hand towels):These non-hazardous waste can be placed in color coded plastic bags(blue or black) and disposed off according to ministry regulations

3- Liquid waste:

- Liquid waste include blood, suctioned fluids ,chemical sterilant solutions and disinfectant.
- Wear appropriate clothing (usually gloves ,mask, eye wear and gown)when handling liquid waste.
- Liquid waste should be carefully poured into a drain connected to a sanitary sewer system. It is recommended that drains be flushed well.

Other important issues:

1- **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 blood-borne diseases from patient to DHCW. In spite of efforts to prevent such injuries, incidents still happen. In such cases please refer to the Ministry Incident report (Appendix 7).

2- Blood spillage:

Cover the spillage with freshly prepared sodium hypochlorite 7X(2.5g tablets) in 1 liter water,Pour over the blood using gloves, wipe up with disinfectant saturated disposal cloth

3- Mouth rinses:

Mouth rinse should be used in surgical procedures in order to reduce number of microbes in patient's mouth, while for other procedures it depends on the judgement of the dentist according to the level of the patient oral hygiene. The mouth rinse should have residual activity to help maintain reduced microbial levels through-out the procedure.

4- Dealing with dental patients with active or suspected infection with tuberculosis:

Due to re-emerging of resistant T.B., DHCW's should strictly adhere to the policy prepared by CDC (Appendix 8).

5- Handling of biopsy specimen:

each biopsy specimen should be put in a sturdy container with a secure lid to prevent leakage during transport. Care should be taken when collecting specimens to avoid contamination from the container. If the outside of the container is visibly contaminated, it should be cleaned and disinfected or placed in an impervious bag.

6- Extracted teeth used in educational purposes:

Extracted teeth used for education of DHCW's should be considered infective. All persons who collect, transport, or manipulate extracted teeth should handle them with the same precautions as a specimen for biopsy.
Before extracted teeth are manipulated in dental educational exercises, the teeth should be cleaned of adherent patient material by scrubbing with detergent and water or by using an ultrasonic cleaner. Teeth should then be stored, immersed in a fresh disinfectant solution suitable for clinical specimen fixation.
Additional personal protective equipment(e.g., face shield or surgical mask and protective eye wear) should be worn if mucous membrane contact with debris or spatter is anticipated when the specimen is handled, cleaned, or manipulated. Work surfaces and equipment should be cleaned and decontaminated with an appropriate disinfectant solution after completion of work activities.

7- Laundry:

Contaminated towels and linen transported away from the clinic for laundering should be placed in appropriate plastic bags to prevent leakage, with appropriate color code(yellow bags or biohazard label).

8- Training for all staff should include:

1. Basic principles of the spread of infection
2. Confidentiality

3. Understanding the practice infection control policy
4. Roles and responsibilities of the practice infection control supervisor
5. Hand hygiene and care
6. Importance and correct use of personal protective equipment
7. Personal protection, including vaccinations

9- Eating, Drinking, Smoking:

Do not eat, drink, smoke ,apply cosmetics, handle contact lenses or store food or drink in working areas where exposure to blood, saliva, tissue or other potentially infectious materials is possible.

Sterilization

Cleaning, disinfection and sterilization are all decontamination processes. These processes differ in the number and types of microorganisms killed. Knowing the differences between the processes will help choose the right way of making contaminated items safe to touch and use.

Cleaning	Disinfection	Sterilization
Physical removal (including prions) but not necessarily killing of microbes	Reduction of the microbial load to a level that makes the disinfected object safe to handle	Killing and removal of all microorganisms including bacterial spores

Types of Decontamination process:

Cleaning:

Cleaning is physically removing debris and reducing the number of microorganisms present. Cleaning is the basic first step in all decontamination procedures. All instruments and equipment should be cleaned before sterilization or disinfection. Cleaning before sterilization or disinfection is sometimes called “pre-cleaning”. For items that do not require sterilization or disinfection thorough cleaning with soap and water is necessary. No proper sterilization or disinfection happens if not preceded by proper washing and cleaning of instruments. Utility gloves that are puncture-resistant ,a mask, protective clothing and protective eye-wear must be worn when handling and cleaning contaminated instruments.

Disinfection:

Levels of disinfection: There are three levels of disinfection:

1. High level disinfection: A disinfection process which kills all micro-organisms(including Tuberculosis) except high numbers of bacterial spores.
2. Intermediate level disinfection: is a disinfection process that destroys vegetative bacteria, most viruses, most fungi, inactivate mycobacterium tuberculosis but does not kill bacterial spores.
3. Low level disinfection: is the least effective disinfection process. It destroys most vegetative bacteria, some viruses, and some fungi but not resistant micro-organisms, e.g., Tubercle Bacilli and bacterial spores

Sterilization:

Sterilization methods:

1. **Steam under pressure(autoclave):**

   Instruments that can withstand high temperature can be sterilized by this method. It is very reliable but it may dull certain sharp items.

2. **Dry heat sterilization:**

   Special instruments need to be sterilized by dry heat such as orthodontic pliers, etc.,. This method leaves instruments dry but it requires a long cycle.

3. **Chemical vapor sterilization:**

   This method depends on heat, water and chemical combination for its efficacy.

E.g.

a- Formaldehyde vapor autoclave:

This method is suitable for orthodontic stainless steel wires. It does not rust or dull instrument, but destroys heat sensitive plastics and requires good ventilation.

b- Ethylene oxide sterilizer:

This method is suitable for heat sensitive items and also for materials that can be exposed to moisture. The used gas (ETO) is explosive and retains in rubber materials. So it needs well aeration and a long cycle, so it is not in current use in our dental care settings.

4. **Liquid chemical disinfectant (cold sterilization):**

   The use of a chemical sterilant is indicated when heat sterilization is not possible. The effectiveness of this method depends on several factors such as concentration of chemical, length of exposure time, and also the nature and concentration of contaminant micro-organisms.
   Gluteraldehyde, Orthophthaldehyde, Hydrogen peroxide etc., are accepted as sterilants and are suitable for sterilization of heat sensitive items. It is less reliable than heat methods and cannot be used with packaged items, that's why it is used only where other alternatives are not applicable.

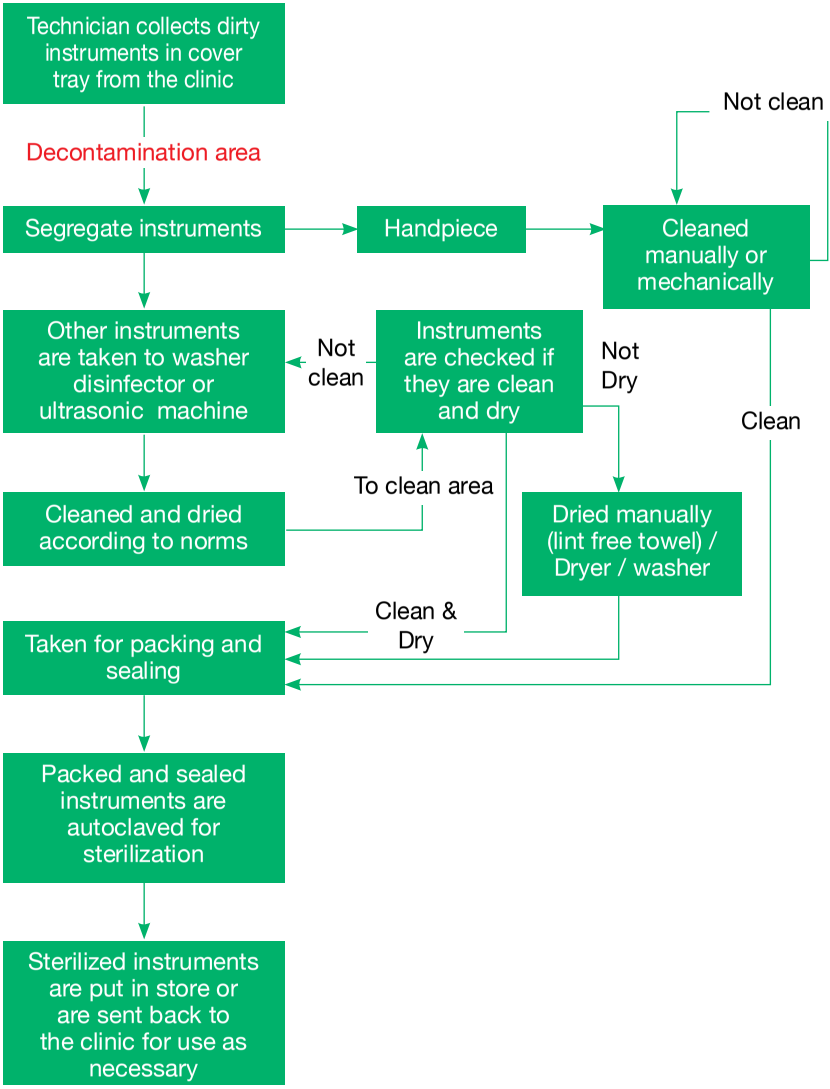
Infection-control categories of patient-care instruments

Category	Definition	Dental instrument or item
Critical	Penetrates soft issue, contacts bone, enters into or contacts the blood stream or other normally sterile tissue	Surgical instruments, periodontal scalars, scalpel blades, surgical dental burs
Semicritical	Contacts mucous membranes or nonintact skin, will not penetrate soft tissue, contact bone, enter into or contact the bloodstream or other normally sterile tissue	Dental mouth mirror, amalgam condenser
Noncritical	Contact intact skin	Radiograph head/cone, blood pressure cuff, facebow

Ideally the Sterilization room is divided into 3 areas.

Decontamination area | Clean Packing area | Clean storage area

Process Flow in Sterilization room



Transportation of contaminated patient care items:

1. The instruments from the clinics to the dirty area of the sterilization room should be transported in appropriate covered puncture resistant container.
2. The contaminated patient care items should be handled only whilst wearing the appropriate personal protective equipment along with heavy duty utility gloves.
3. The used instruments should be placed in a holding solution of detergent or an enzymatic cleaning solution to prevent the drying of debris ,if they cannot be cleaned soon after use.

Decontamination area:

1. Appropriate personal protective equipment should be worn along with puncture and chemical resistant, heavy duty utility gloves for all cleaning and decontamination procedures.
2. Before starting a disinfection procedure, clean all visible blood and other debris from the instruments. There are three methods for cleaning instruments - Manual, ultrasonic bath and Washer disinfector.
3. If manual cleaning is necessary for any sharp instruments, then work- practice controls that minimize contact with the instrument should be used. (ex: Long handled brush)
4. To decrease exposure to potentially infectious material and for effective cleaning, automated cleaning equipment (Washer-disinfector or ultrasonic bath) should be preferably used to remove debris.
5. The instruments should be inspected for any leftover debris or damage and then dried thoroughly before packaging them for sterilization. There are three methods for drying cleaned instruments – by using a lint free towel, by the dryer included in the washer or an individual dryer.

Packaging and Sterilization:

1. All instruments should be inspected for cleanliness before wrapping them or placing them in cassettes or organizing trays to maintain sterility during storage.
2. In dental settings, all heat tolerant instruments are generally sterilized by steam under pressure. Hinged instruments like hemostats, extraction forceps , scissors etc. should be processed open and unlocked to permit the sterilizing agent to contact all surfaces.
3. An internal chemical indicator should be used in each package. If it is not visible from outside then an external indicator should also be used.
4. All wrapping material or the container system used for packaging should be compatible with the type of sterilization process being used. Always follow manufacturer's instructions for proper use.
5. Each instrument pack should be labeled with the date and the name of the technician responsible for cleaning and packing the instruments.
6. 6. All instruments / packages should be placed loosely and correctly into the sterilizer so as not to impede penetration of the sterilant.
7. The type of cycle selected should be appropriate for the instruments being sterilized.
8. Use only medical devices for the purpose of sterilization of contaminated patient care items.

Monitoring Sterilization:

Sterilization is a process that requires continuous monitoring to measure the efficiency of the system. Several factors may diminish the effectiveness of the sterilization process e.g., improper wrapping of instruments which can prevent adequate penetration on the instrument surface, internal chamber temperature variations and sterilizer malfunction.

There are several methods of monitoring for the different types of sterilization e.g., for heat sterilization the following monitoring methods are used:

1. **Chemical test**:This test should be carried out daily using the available methods, such as the chemical strips,Bowie-Dick type test pack & Helix test.
2. **Biological test:** This test should be done at least once weekly or more often if the practice demands it, using the appropriate spore test.
3. **Physical test:** This method of monitoring is done by considering physical indicators like time, temperature and pressure.
4. **Leak test:** The Leak test is intended to check that air will not leak into the sterilizer during periods of vacuum, at a rate greater than specified by the manufacturer. Most autoclaves should be fitted with automatic leak detection function test, and this should be indicated within the Instructions for Use.

Maintain sterilization monitoring records in compliance with the local regulations (MOH forms).

Storing and transportation of clean dental supplies:

1. To prevent condensation in packaged items ,the instruments should be totally dried and cooled before packing.
2. All sterile and clean instruments should be stored in closed cabinets preferably.
3. The principle of 'first - in, first - out' should be used for inventory management.
4. The shelf life of sterilized instruments is the period during which an item is considered safe for use. It depends on the quality of the packaging material, storage conditions, and conditions during transport and the amount of handling an item has received.
5. The supply cart used for transporting sterilized items to dental clinics should be cleaned and dried prior to use.
6. All clean supplies should be transported only in a covered or enclosed cart as and when required to the clinical areas.

7. All packages of sterilized instruments should be examined prior to use to ensure that the barrier wrap has not been compromised during storage. Packages that have been compromised should be sent back for re-cleaning, packing and sterilization.

Recommendations:

1. The sterilizer should be allowed to run through the "full-cycle" which also includes the drying process, each time, for maximum effectiveness. Do not attempt to remove the instruments before completion. Allow packages to dry in the sterilizer before they are handled to avoid contamination.
2. Do not disinfect when you can sterilize.
3. Heat sensitive instruments should be processed using a high level disinfectant. Follow the manufacturer's instructions for correct use.
4. If used only once and disposed off correctly, single use disposable instruments are preferable.
5. All non-critical patient care items should be barrier protected or if visibly soiled, should be cleaned and disinfected after each use with the recommended disinfectant.
6. All dental health care workers should be aware of the side effects of the chemicals being used for disinfection.

Glossary:

Aerosols – Particles of respirable size (<10µm) generated by both humans and environmental sources that can remain viable and airborne for extended periods in the indoor environment; commonly generated in dentistry during use of handpieces, ultrasonic scalers, and air/water syringes.

Barrier – An item that blocks the penetration of microorganisms, particulates and fluids, thereby reducing the potential contamination of the underlying surface. Also referred to as 'Surface barrier'.

Bioburden – Organic material on a surface or object prior to cleaning or sterilization; (Or) the number of viable organisms in or on the object or surface. Also known as 'bioload' or 'microbial load'.

Biofilm – A complex colony of microorganisms, most notably bacteria, that forms on the surfaces that are bathed with water.

Contamination – Presence of microbes on the body surfaces or on inanimate objects or water.

Cross - contamination – Spreading of microorganisms between persons and / or surfaces.

Disinfection – Destruction of most pathogenic and other kinds of microorganisms (but not spores) by physical or chemical means.

Droplet nuclei – Microscopic particles (5 microns or less in diameter) formed by the dehydration of airborne droplets containing microorganisms. These particles can remain suspended in the air for long periods of time.

Infection – The entry and development or multiplication of an infectious agent in the body.

Nosocomial infection – An infection acquired in a hospital as a result of medical care.

Parenteral – Taken into the body or administered in a manner other than through the digestive tract, as by intravenous or intramuscular injection.

Pathogens - These are organisms capable of causing infection in a susceptible host.

Percutaneous injury – An injury that penetrates the skin, such as a needle stick or a cut with a sharp object.

Per mucosal - Through mucosa.

Secretion- A fluid or substance, formed or concentrated in a gland and passed into the elementary tract, the blood or the exterior.

Sterilant – A liquid chemical germicide capable of destroying all forms of microbiological life, including high numbers of resistant bacterial spores.

Sterilization – A physical or chemical process that destroys all microorganisms, including spores.

References:

1. Guidelines for infection control in Dental health care settings (ADA-Continuing Education research program)-Crest 2009
2. Guidelines for infection control (ADA) – 2008
3. CDC. Infection Control Guidelines. Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings - 2007
4. Organization for Safety, Asepsis and Prevention (www.osap.org)
5. Occupational safety and health administration (www.osha.gov)
6. Infection control guidelines in dental practice, Ministry of health,Kuwait-2004
7. Practical guidelines for Infection Control in health care facilities(WHO) – 2003
8. Guidelines for infection control in dental healthcare settings (MMWR – 2003)
9. Infection Control for the Dental Team (Clinical Practice 3) by Michael Martin, Martin Fulford, Tony Preston – Quint Essentials (2009)
10. Basic Guide To Infection Control In Dentistry (2009) Caroline L. Pankhurst and Wilson A. Coulter.

Appendix 1

1a. Vaccinations recommended for dental staff

Disease	Route	Length of protection
Diphtheria	Intramuscular	Probably lifelong if given in infancy, but some authorities recommend re-vaccination in adolescence
Hepatitis B	Intramuscular	Probably lifelong but some countries recommend re-vaccination every 5 years
Pertussis	Intramuscular	Probably lifelong
Poliomyelitis	Oral	Probably lifelong
Tetanus	Intramuscular	Probably lifelong
Tuberculosis	Subcutaneous	Protection can last for 15 years in some people, but is incomplete

1b. Micro-organisms implicated in infection from dental treatment

Micro -organism	Probable route of transmission
Herpes Simplex type 1	Hands, record cards, splatter from oral cavity
Hepatitis B	Sharps injuries, trans – conjunctival
HIV	Possibly contaminated needles or local – anesthetic
Hand, foot and mouth disease	Direct contact with infected skin
Methicillin resistant Staphylococcus aureus	Hands
Tuberculosis	Aerosols
Pseudomonas aeruginosa	Infected water lines, aerosols
Legionella pneumophilia	Infected water lines, aerosols

Appendix 2

Hand washing technique

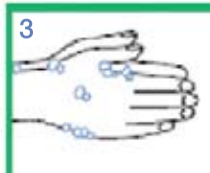
1

Remove jewellery and wet hands and wrists with warm water.

2

Use 1 or 2 Squirts of liquid or foam soap.

3



Lather soap and scrub hands well, palm to palm.

4

Scrub in between and around fingers.

5

Scrub back of each hand with palm of other hand.

6

Scrub fingertips of each hand in opposite palm.

7

Scrub each thumb clasped in opposite hand.

8

Scrub each wrist clasped in opposite hand.

9

Rinse thoroughly under running water.

10

Pat hands dry with paper towel.

11

Turn off water using same paper towel.

Appendix 3

3a - Sequence for donning PPE:

CORRECT SEQUENCE FOR *DONNING* PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required; e.g., Standard and Contact, Droplet or Airborne Infection Isolation.

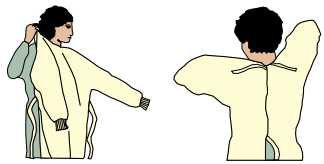
Remove hand jewellery and tie back hair.

Clean and dry hands thoroughly.

1. GOWN / APRON

Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back

Fasten in back of neck and waist



2. MASK OR RESPIRATOR

Secure ties or elastic bands at middle of head and neck

Fit flexible band to nose bridge

Fit snug to face and below chin

Fit-check respirator

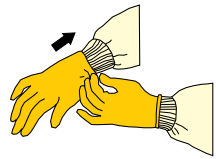
3. GOGGLES OR FACE SHIELD

If you wear glasses put them on.

Place goggles or face shield over face and eyes and adjust to fit

4. GLOVES

Extend to cover wrist



Appendix 3

3b - Sequence for removing PPE:

CORRECT SEQUENCE FOR *REMOVING* PERSONAL PROTECTIVE EQUIPMENT (PPE)

1. GLOVES

Outside of gloves are contaminated—DO NOT TOUCH!

Grasp outside of glove with opposite glovedhand; peel off

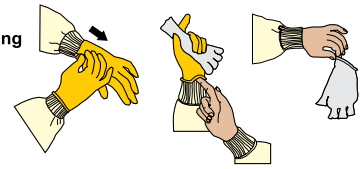
Hold removed glove in gloved hand

Slide fingers of ungloved hand under remaining glove at wrist

Peel glove off over first glove

Discard gloves in waste container

Clean and dry your hands thoroughly



2. GOGGLES OR FACE SHIELD

Outside of goggles or face shield are contaminated—DO NOT TOUCH!

To remove, handle by head band or ear pieces

Place in designated receptacle for reprocessing or in waste container

Clean and dry your hands thoroughly

3. GOWN / APRON

Gown front and sleeves are contaminated—DO NOT TOUCH!

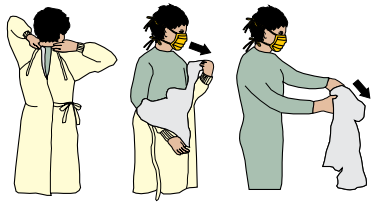
Unfasten ties

Pull away from neck and shoulders, touching inside of gown only

Turn gown inside out

Fold or roll into a bundle and discard

Clean and dry your hands thoroughly



4. MASK OR RESPIRATOR

Front of mask/respirator is contaminated—DO NOT TOUCH!

Grasp bottom, then top ties or elastics and remove

Discard in waste container

Clean and dry your hands thoroughly

Appendix 4

Types of Disinfectant used in dentistry

Name	Description	Composition	Dilution	Used in	Time	Notes
HANDS						
HYDREX	SURGICAL scrub	4% Chlorhexidine gluconate & Detergent	Ready to use	Hygienic hand washing and scrubbing	According to use and specified standards	--------
HYDREX clear	Hand rubs	0.5% Chlorhexidine gluconate & 70% ethanol	Ready to use	Hand antiseptic	According to use and specified standards	--------

Name	Description	Composition	Dilution	Used in	Time	Notes
SURFACES & ENVIRONMENT						
Presept	Intermediate to high level disinfectant tablets (2.5gm tablets)	Each tablet contain 50% troclosene sodium	½ tablet dilute in 5 Liter Water 7 tablets in 1 liter water	surface Disinfection Blood Spillage	--------	All solutions should be prepared fresh daily
Actichlor	Intermediate to high level disinfectant tablets (2.5gm tablets)	Sodium Dichloro-isocyanurate (NaDCC), Troclosene sodium.	For a concentration of 1000ppm, dissolve 1 tablet in 1.5 Liter of water. 7 tablets in 1 Liter of water for body fluid spills (10,000 ppm)	surface Disinfection Blood Spillage	--------	--------
Optim 33TB wipes	Intermediate level disinfection	accelerated 0.5 % Hydrogen Peroxide	Ready to use	Surface cleaner & Disinfection	According to use, as specified by the manufacturer	--------

Name	Description	Composition	Dilution	Used in	Time	Notes
IMPRESSION						
Cidex OPA	High level disinfectant liquid	0.55% Ortho-phthalaldehyde (active ingredient)	Ready to use	Impression Disinfection shade guides & Heat sensative items	5 minutes	- 75 days expired once opened - 14 days once used - ventilation
MD 520 Impression disinfectant	—	0.25% Benzalkonium chloride, 0.5% Gluteraldehyde	Ready to use	Impression Disinfection	5 minutes	--------
INSTRUMENTS & ULTRASONIC						
Enzymatique Triple enzme, detergent disinfectant solution	Intermediate level disinfection	Quartenary ammonium propionate, Polyhexanide, Enzymatic	20ml per 2 litres of water (1 liter bottle: fill dose to 20 ml indicator)	For manual wash and ultrasonic cleaner	Contact time 15 minute	--------

Name	Description	Composition	Dilution	Used in	Time	Notes
WASHER DISINFECTOR						
Machine detergent (Sumazon L 46)	detergent	--------	2 – 5 gm / liter	For Washer-Disinfector	As specified by the manufacturer	--------
Zero spot (Suma A5)	Rinse aid	--------	Ready to use	For Washer-Disinfector	as specified by the manufacturer	--------
OTHERS						
Acetic acid 6%	Disinfectant and cleaning liquid	6% Acetic acid	Ready to use	For cleaning both bench top autoclaves & water distiller		--------

Appendix 5

Bayonet method of re-sheathing needles:

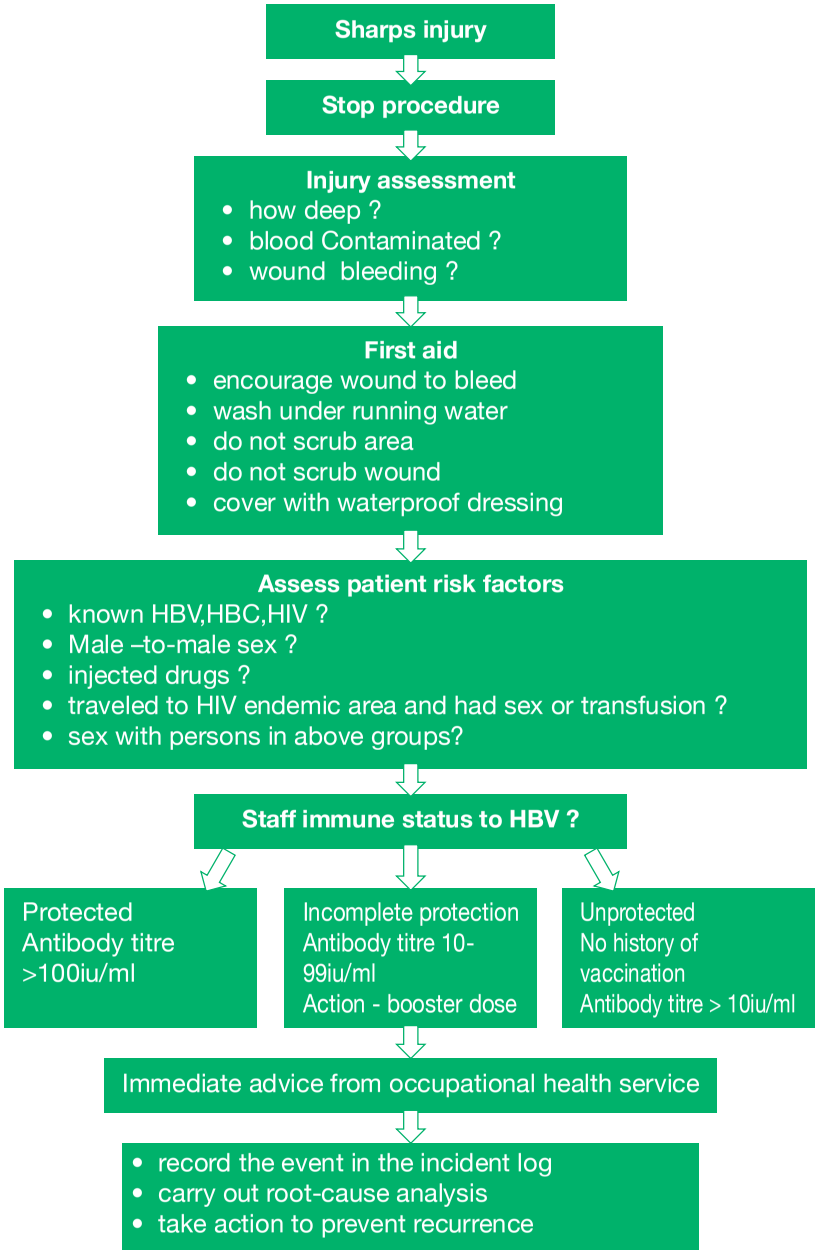
a - the sheath is located one handed

b - the sheath is placed over the needle

c - the sheath is then is pushed firmly into place

Appendix 6

Sharps injury protocol:



Appendix 7

Ministry of Health, Kuwait.

Strictly Confidential

Incident report for exposure to blood / body fluids

Serial no. ☐ ☐ ☐ ☐ ☐ ☐ ☐

Dental center ..... Unit ..... Poly clinic .....

N.B. Report to Infection Control Office within 24 hours from exposure.

Part I : Exposed person

1) Name ..... 2)D.O.B / Age: / /

3) Job title / Specialty: ..... 4) Date of exposure: / /

5) Place of exposure 6) Time of exposure: am / pm

7) Hepatitis 'B' vaccination previously: none / undetermined / received with date(s)

7.1) / / 7.2) / / 7.3) / /

8) Status of:

8.1 ☐ HBV antibodies 8.2 ☐ HCV antibodies 8.3 ☐ HIV immunoassay

9) Description of the incident:

Body fluid / material	**Cause of exposure**	**sites of exposure**
1 ☐ blood	1 ☐ needle stick	1 ☐ intact skin
	2 ☐ splash	2 ☐ non- intact skin
2 ☐ saliva / sputum	3 ☐ sharp object	3 ☐ percutaneous
	4 ☐ cut / wound	4 ☐ eye
3 ☐ others	5 ☐ others (specify)	5 ☐ others (specify)
.....	.....	.....

10) Activity leading to the incident:

1 ☐ Drawing blood / placing the needle in the patient
2 ☐ Recapping the needle.
3 ☐ Administration of medication / cut- glass.
4 ☐ Garbage collection.
5 ☐ Cleaning surgical instruments
6 ☐ Performing surgical intervention
7 Others(specify) .....

11) Causative factors:

1 ☐ Butterfly needles 2 ☐ Vaccutainer 3 ☐ Others (specify)

12) Other comments related to the incident

.....
.....
.....

Part II Source:

Unknown – skip part II Known – complete

1. Name of the source person .....
2. Hospital no. / I.D. no. .....
3. Place / D.O.B ...../...../..... 4. Sex: ☐ Male ☐ Female
5. Nationality: .....
6. Home address: ..... 7.Phone no. .....
8. Relevant risk factors:

☐ Haemodialysis ☐ Hemophiliacs ☐ H/o blood / blood derivatives transfusion(s)
☐ I.V drug user ☐ Liver diseases / jaundice ☐ Children born to HBV,HCV,HIV positive mothers
☐ Residence of mentally retarded institutions ☐ Others (specify)

Name & Signature ..... Name & Signature of ..... Name & Signature of ..... of exposed person treating physician Consultant / Person in charge

(Preventive Medicine Department)

....

Date:..... Date:..... Date:.....

Part III Action plan: .....

.....

.....

.....

Date: .....

To be completed in triplicate

1. Original to exposed person
2. Second copy to Infection control office
3. Third copy to Head of department.

Name & Signature of
Infection control dentist

Appendix 8

Policy for treatment of dental patients with active or suspected tuberculosis.

1. During initial medical history and periodic updates ask patients about any history of TB disease or symptoms suggestive of TB. Symptoms include productive cough, night sweats, fever, fatigue and unexplained weight loss. Note that positive TB skin test without symptoms does not indicate active infection in most cases.
2. Patients with history and symptoms suggestive of active TB should be promptly referred to a physician for evaluation for possible infection.
3. Elective dental treatment should be postponed until a physician confirms, using recognized diagnostic evaluations, that the patient does not have active TB.
4. 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 be 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.
5. DHCW's 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.

Appendix 9

Ministry of Health

Quality Assurance & Infection Control Office
Recommended measures if exposure to blood / body fluids among DHCW's

These instructions are to prevent transmission of blood-borne diseases and are to be followed by any health care worker who have had a significant exposure to potentially infectious body fluids.

1. Squeeze the exposure to encourage bleeding, then wash thoroughly with soap and water and wipe with 70% ethyl-alcohol. When dry, cover with a water proof dressing. In case of splashes to mouth or eyes rinse thoroughly with plenty of clean water.
2. Avoid exposing any patient to your blood, especially while performing any invasive procedure or having your blood come in contact with the mucous membranes, surgical wound or non-intact skin of the patient.
3. Do not donate blood, body organs or breast milk until your HBsAg / HIV test result is negative after 6 months of the exposure date.
4. Take care of your own wound if there is bleeding, and the person taking care of your wound should wear gloves and wash hands immediately after care.
5. If your blood contaminate any surface or floor, wipe it up immediately with disposable paper towel, clean and disinfect the area with the recommended disinfectant (Hypochlorite).
6. Avoid sharing with others any personal items that might have been contaminated with your blood(tooth brushes, nail cutter, razors and needles etc.,)
7. Avoid pregnancy, breast feeding and use barrier precautions during sexual contact until your HBsAg / HIV test result is negative after 6 months of the exposure date.

Appendix 10

Daily Infection Control Checklist for the clinics:

Before each patient treatment:

- hand Washing.
- Use disposable coverings for surfaces likely to become contaminated or clean with disinfectant wipes if available.
- Set out equipment and materials for procedure.
- Provide eye protection and protective cover for patient.
- hand Washing.
- Put on Personal Protective Equipment (P.P.E)

During patient treatment:

- Treat all patients as potentially infectious.
- All water lines for syringes and for handpieces should be turned on and flushed for several minutes once with hand pieces disconnected then with connected handpieces at the beginning of the day and 20-30 seconds between patients.
- Use rubber dam where appropriate.
- Use high volume aspiration when using turbine handpieces and ultrasonic scalers, starting the aspirator before reusing the handpiece or scaler.
- Handle sharps carefully; only re-sheath needles using a safety device.
- Clean dental materials from instruments during treatment carefully.

After patient treatment:

- Dispose of sharps in sharps container.
- Segregate and dispose of clinical waste.
- Decontaminate all work surfaces that have been contaminated.
- Clean and disinfect impressions and appliances before dispatch to the laboratory.
- Send all the used instruments to the C.S.S.D.
- Remove and dispose of gloves.
- hand Washing.
- Write up clinical notes.


User
Clean & Disinfection
Inspection & Packing
Sterilization
Sterile Storage
Distribution
Quality Assurance