

INFECTION CONTROL GUIDELINES

**FACULTY OF DENTISTRY
UNIVERSITI SAINS ISLAM MALAYSIA**

**Faculty of Dentistry USIM
Infection Control Committee
2022**

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1. INTRODUCTION

Patient safety is an important medical discipline which aims at improving quality of patient care, minimizing treatment mistakes, and improving safety. Infectious diseases represent an important public health problem facing health care systems in many countries, including Malaysia.

Provision of dental care is not free from risk. Cross-infection during clinical practice can occur with transmission of infectious agents between patients and oral health care workers (OHCW) in a clinical environment if adequate precautions are not taken. Transmission of dental infection can occur through infected air droplets, blood, saliva, and instruments contaminated with secretions.

This guideline is produced to set a standard infection control measures that OHCW practicing in Faculty of Dentistry USIM should take to protect their patients, other OHCW and themselves. This guideline incorporates the guideline produced by Malaysian Dental Council (MDC) with Dental Services Division, Ministry of Health Malaysia 2017, but at the same time taking into consideration the facilities we have available in the Faculty of Dentistry, Universiti Sains Islam Malaysia.

2. RESPONSIBILITIES OF ORAL HEALTH CARE WORKERS

2.1 Hand hygiene

2.1.1 Introduction

Hand hygiene is a general term used to describe cleaning hands by using soap and water, antiseptic wash or by using an alcohol-based hand rub (ABHR) solution.

Hand hygiene is the single most important way to stop the spread of germs. If the hands of those caring for a patient, as well as the hands of the patient and their family/visitors, are kept clean, the risk of the patient getting an infection will be far less.

2.1.2 Fundamental Principles of Hand Hygiene

- An alcohol-based hand rub (ABHR) is the preferred method for cleaning the hands when they are not visibly dirty because:
 - i. It is more effective at killing potentially deadly germs on hands than soap
 - ii. It requires less time
 - iii. It is more accessible than hand washing sinks
 - iv. It reduces bacterial counts on hands, and
 - v. It improves skin condition with less irritation and dryness compared to soap and water
- Perform hand washing with plain or antimicrobial soap and water if:
 - i. Hands are visibly soiled or dirty
 - ii. Caring for a patient with suspected or known gastrointestinal infection e.g., Norovirus or a spore forming organism e.g., *C. difficile*
- Avoid washing with hot water to prevent drying of skin. Liquid soap from reusable containers must be cleaned regularly every 24 hours and dried before refilling with fresh soap to avoid microbial contamination. If the liquid soap reaches a minimum level, it needs to be changed and cleaned despite less than 24 hours.
- Bar soap is not recommended as they can easily become contaminated.
- Gloves should not be regarded as a substitute for hand hygiene. An alcoholic rub or hand wash should be performed after removing gloves and before sterile gloves are worn.
- Drying is an essential part of hand hygiene. Wet hands have higher bacterial counts. Disposable paper towels should be used to dry hands. Air hand dryers are not recommended in clinical areas because of the risk of bacterial dispersal from aerosols.
- Fingernails must be kept short. Avoid biting the fingernails as these compromises the integrity of the surrounding skin.

- Intact skin is impermeable to blood-borne viruses and therefore hand skin integrity and care is crucial. Use moisturizing lotions and creams to help maintain skin integrity. Use only water-based hand lotions and creams as petroleum-based lotions and creams interfere with the integrity of latex gloves.

2.1.3 Performing hand hygiene using hand soap

- Wet your hands with clean, running water (warm or cold), turn off the tap, and apply soap.
- Lather your hands by rubbing them together with the soap. Lather the backs of your hands, between your fingers, and under your nails.
- Scrub your hands for at least 20 seconds. This is roughly the duration of the “Happy Birthday” song sang from beginning to end twice.
- Rinse your hands well under clean, running water.
- Dry your hands using a clean tissue or air dry them.

2.1.4 Performing hand hygiene using alcohol rub

- Apply the gel product to the palm of one hand.
- Rub your hands together.
- Rub the gel over all the surfaces of your hands and fingers until your hands are dry. This should take around 20 seconds.

1. Apply a palmful of the sanitiser in a cupped hand







<p>2. Dip all fingers into the solution</p>	
<p>3. Rub hands palm to palm, also with fingers interlaced</p>	
<p>4. Rub left hand palm over the right dorsum with interlaced fingers and vice-versa.</p>	
<p>5. Rotational rubbing of the right thumb clasped in the left palm and vice-versa.</p>	

Figure 1: Steps for using alcohol hand rub

2.2 Using Personal Protective Equipment (PPE)

PPE such as gloves, masks, protective eyewear, and protective clothing must be worn by all oral health care workers (OHCW) in appropriate situations. Currently, the PPE to be worn should comply as per COVID-19 guidelines provided by the Ministry of Health.

2.2.1 Gloves

- Gloves must be worn by OHCW when examining and treating patients or in any other situation where their hands may come into contact with blood, body fluids and other clinical debris.
- Wearing gloves should never replace hand washing. Hands must be washed both before and after using gloves.
- Gloves must be discarded in the event of visible puncture, and hands must be washed before new gloves are put on.
- Disposable gloves are single use items and must be discarded after use on each patient. They must not be washed, disinfected, or sterilized.
- OHCW with non-intact skin (wounds, skin lesions etc.) on their hands must cover all breaks in the skin with waterproof dressings before wearing gloves (especially when performing a procedure). Double gloves can be used if the hands are extensively affected. OHCW should however avoid invasive procedures or procedures involving the use of sharp instruments when their skin lesions are active, or if there are extensive breaks in the skin surface.

2.2.2 Masks, Protective Eyewear, Face Shields, and Protective Clothing

- Debris, sprays and splashes generated during procedures may contain blood-borne viruses, which can gain entry into the bloodstream of the OHCW (both the operator and assistant) through the nasal and oral mucosa and the conjunctiva. Surgical masks (which cover both the mouth and nose) and appropriate protective eyewear (goggles or face shields) should be worn during such procedure, by both the operator and the assistant.
- masks should be changed:
 - after a patient, if sprays or splashes have been generated during the procedure;
 - or
 - when it becomes wet from within
- Single and 2-ply masks **SHOULD NOT** be used by either the operator or the assistant as they provide almost no protection. Fluid-resistant mask should be used and should not be touched while being worn.
- Protective eyewear and face shields must be cleaned with soap and water and disinfected with a low-level disinfectant after each patient.
- Appropriate protective clothing should be worn during procedures that are likely to generate debris, sprays and splashes. The requirements for protective clothing include:
 - minimises the amount of uncovered skin and clothing
 - design which allows the cuffs to be tucked into gloves (long-sleeved)

- covers at least to the knees when seated – especially for surgical procedures
 - continuous in front or has a well-sealed closure
 - provides an effective barrier against bacteria even when wet i.e. high level of fluid resistance especially for surgery
 - enclosed footwear should be worn during procedure to protect against injury from dropped objects, sharps and materials
 - protective clothing should be removed immediately upon leaving the work area.
- Contaminated reusable protective clothing should be soaked in disinfectant (intermediate level) before being washed with detergent and water.

2.3 Hepatitis B Vaccination

All oral health care worker (HCW) and students should be immunized with the Hepatitis B vaccine or show serological evidence of immunity to Hepatitis B virus infection [positive for antibody to the Hepatitis B surface antigen (anti-HBs)].

- Important points to note with regards to Hepatitis B vaccination:
 - a) Hepatitis B status should be checked as part of screening prior to starting work for all oral HCW and all the students prior to starting their clinical year. If HBsAg is negative, anti HBs level will be checked to assess the antibody level.
 - b) The vaccination regime consists of 3 intramuscular injections at 0, 1 and 4 to 6 months.
 - c) Post-vaccination antibody level testing is essential and is done 1 to 2 months after completion of the primary vaccine series.
 - d) Responders to the primary vaccination series are those with anti-HBs levels more than 10mIU/ml and this signifies immunity to Hepatitis B infection. In such individuals, no further doses or testing are indicated as there is life-long protection.
 - e) Non-responders to the primary vaccine series are those individuals whose anti-HBs level is <10mIU/ml. Such individuals are revaccinated with a second series of 1 to 3 doses.
 - f) Pregnancy or lactation is not a contraindication to vaccination.

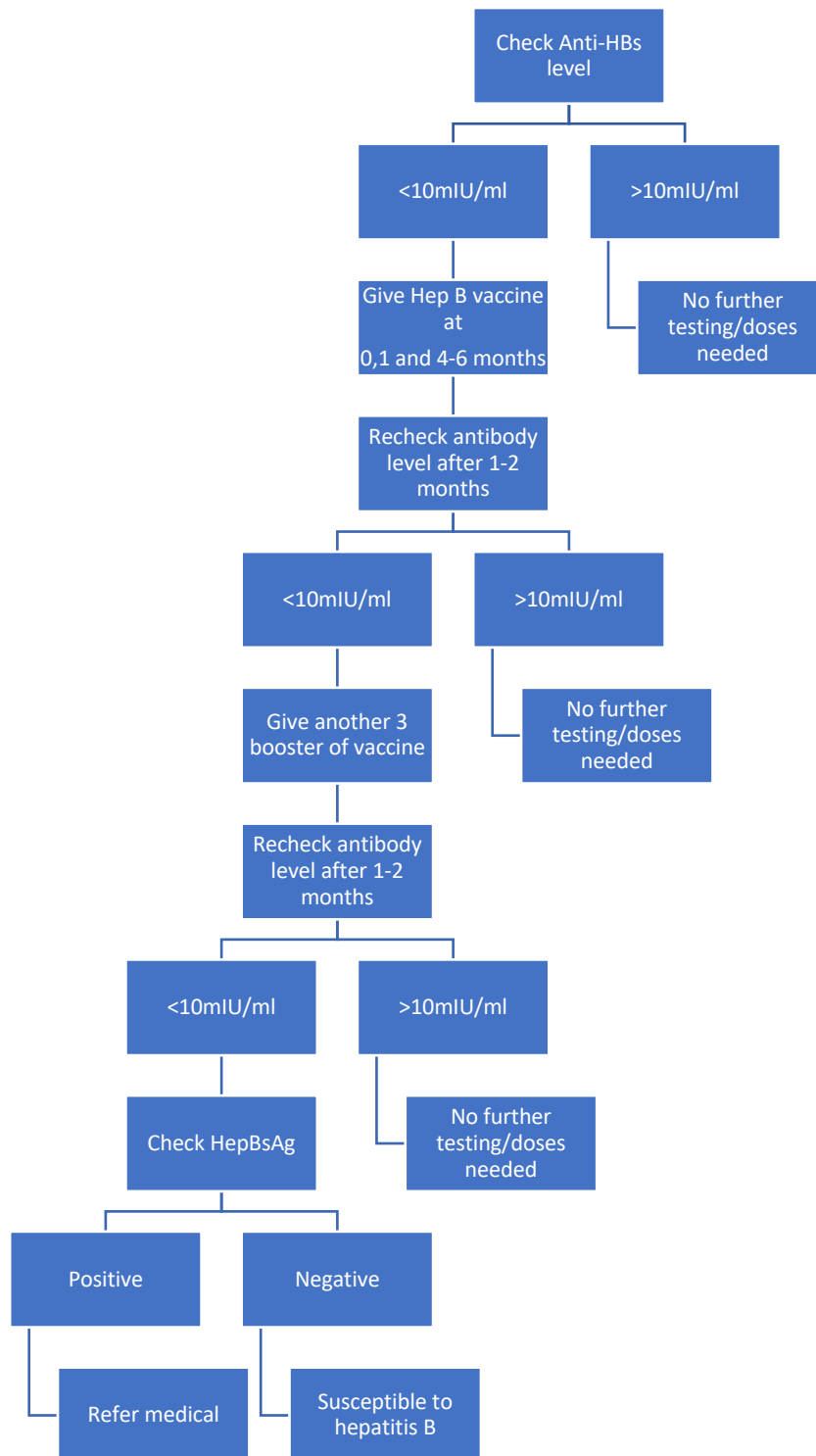


Figure 2: Workflow for Hepatitis B antibody testing

2.4 Oral HCW with blood borne infection

- Human Immunodeficiency Virus (HIV), Hepatitis B (HBV), Hepatitis C (HCV) infections are serious illnesses that are transmissible by blood or other body fluids. There is a small remote possibility that a medical practitioner infected with one or more of these diseases may transmit the virus while performing exposure-prone invasive procedures. Standard infection control precautions will reduce this risk significantly.
- HCW who perform Exposure Prone Procedures (EPP), and who become aware that they are infected with a blood borne pathogens, are ethically obliged to report to the Clinical Coordinator or The Dean. Where a HCW does disclose his or her infection status to an employer, the disclosure must be treated with due regard to the HCW's right to confidentiality.
- All infected HCWs must be treated by a medical specialist in the respective discipline (gastroenterologist/infectious disease physician). If the diagnosis was made during a screening done in the faculty, referral must be made to the respective discipline.
- All infected HCWs who perform Exposure Prone Procedures shall be further assessed for the risk of transmission of the disease to the patient. Each case will be assessed on case-by-case basis. The faculty management team's decision will be guided by the HCW's condition, recommendation by the infected HCW's physician and the Ministry of Health's guidelines.

2.4.1 Management of the infected HCW not allowed to perform EPP

- All infected HCW who are not allowed to perform Exposure Prone Procedures shall be provided with the following opportunities:
 - i. To continue their chosen work, where practical, or
 - ii. To obtain alternative career training.
- Modification of work or transfer of duties and retraining shall be discussed and decided the faculty management team and the Dean of Faculty in consultation with the infected HCW.

2.5 Other Responsibilities of OHCW

- All instruments entering the patient's mouth or contacting non intact skin must be sterile.
- All clinical contact surfaces must be disinfected appropriately before the patient sits on the dental chair.
- Bibs should be worn for all patients undergoing non-surgical procedures. Reusable bibs must be disinfected and washed after use on each patient. For surgical procedures, sterile drapes should be used.

- Protective eyewear should be worn for all patients to protect against physical damage to the eye from propelled and dropped objects. All protective eyewear must be washed and if visibly contaminated, disinfected after use on each patient.
- Rubber dams should be used where appropriate.
- If the patient is sensitive to latex, precautions must be taken to use non-latex gloves, non-latex rubber dams, and to avoid any other latex-containing products.
- Food and drinks should not be consumed in the clinical area.

3. CLEANING, DISINFECTION AND STERILISATION OF INSTRUMENTS

The cleaning, disinfection, and sterilisation of instruments in the dental clinic, Faculty of Dentistry, USIM follows an organized processing and must adhere to the guidelines based on the Ministry of Health Infection Control, 2019. The processing for contaminated instruments is summarized in a flowchart (Figure 3).

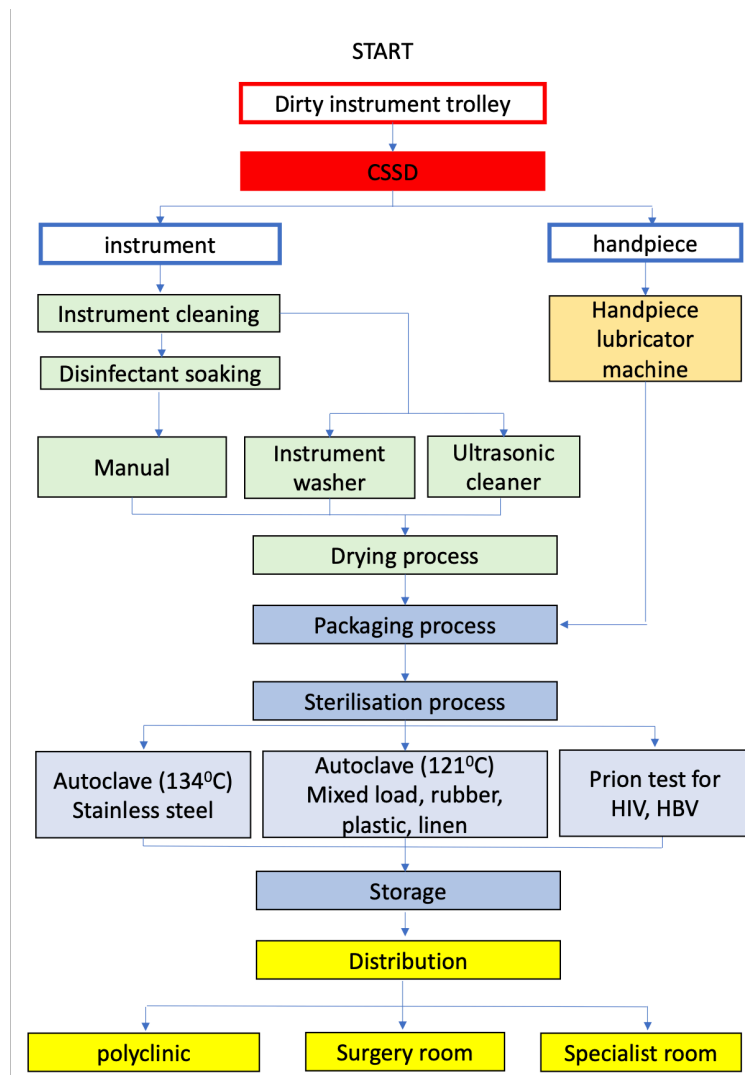


Figure 3: Workflow of cleaning, disinfection, and sterilization of equipment

The contaminated instrument processing starts with the dirty trolley being sent to the Central Supply Department (CSSD). Following this, the instruments must be categorized, cleaned, packaged, sterilized, distributed, and stored properly.

3.1 Categorization

Prior to the cleaning of the instruments, categorization need to be made based on degree of contamination and type of disinfection required. Instruments are classified into critical, semi-critical and non-critical instruments. Below are the definitions of each category:

1. Critical instruments are surgical and other instruments that penetrate soft tissue or bone and/or contacted blood. Examples of critical instruments are forceps, scalpels, bone rongeur, scalers and burs. Critical instruments required steam sterilization.
2. Semi-critical instruments are instruments that do not penetrate soft tissue or bone but contact oral tissue or non-intact skin such as amalgam condensers, mouth mirrors, dental handpieces, and digital radiography sensors. These instruments need to be steam sterilized or treated with high level disinfectant if sterilization is not possible.
3. Non-critical instruments and devices are instruments that only contact with intact skin. The examples of non-critical instruments are x-ray cone and facebow. The instrument can be cleaned with low-level disinfectant. However, if the instruments are contaminated with blood, intermediate level disinfectant need to be used.

3.2 Processing area

Instruments need to follow a one-way direction from decontaminated to cleaned area. These areas should be labelled and divided as such:

- Decontamination area (cleaning area)
- Packaging and sterilising area
- Storage area

3.3 Instrument cleaning

Instruments should be wiped clean from visible blood by the operator to prevent infection during transporting the instrument to the processing area. At the processing area, the instruments should then be soaked in disinfectant to make the instruments safe for subsequent handling especially when it is washed by hands.

a) Manual cleaning

During cleaning, appropriate PPE such as heavy-duty utility gloves, masks, protective eye wear and protective clothing must be worn. A long-handled brush is used to scrub the instruments. To minimize splashing, scrub the instruments while submerged in water/solution.

b) Instrument washer and ultrasonic cleaner

Instruments washer can be used instead of manual cleaning to wash instruments only. The ultrasonic cleaner is used to clean burrs and instruments. When using ultrasonic cleaners, pre-cleaning disinfection (if disinfectant is used in ultrasonic cleaners) and scrubbing are not required. Only a few instruments such as high-speed handpiece cannot be cleaned by this method.

After cleaning and before sterilisation, instruments should be rinsed with water and handled using gloves as if the instruments are still contaminated.

Handpiece and other detachable devices such as scaler should be autoclaved. For handpiece, lubricants need to be used according to the manufacturers' instruction using the lubricator machine. Handpieces should be wiped with alcohol and then packaged for sterilization process.

3.4 Instrument packaging

Instruments need to be dried before packaging. Instruments may be packaged as set items or as individual items. Hinged instruments such as forceps need to be left open. A container needs to be used for semi-critical and critical items to maintain sterility after sterilization. Internal chemical indicator should be placed inside every package. External chemical indicator can be used if internal indicator cannot be seen from outside of the package.

3.5 Sterilisation

Critical and semi-critical autoclavable instruments must be autoclaved. There are different types of autoclaves based on the use. Type B and types S is used to process solid, hollow, or porous items, while Type N is a simple downward displacement autoclave whereby only solid and unpackaged items are processed.

Type B (vacuum)	Solid, hollow, and porous items. Single, double-wrapped, packaged, and un-packaged items.
Type S (vacuum)	Unpackaged solid items, or any items indicated for Type B autoclave.
Type N (non-vacuum/downward displacement)	Unpackaged solid items.

Table 1. Types of autoclaves and their uses.

In the USIM dental clinic, critical and semi-critical autoclavable instruments must be autoclaved using full cycle at 134 degrees Celsius. For unwrapped instruments, gauze, linen and non-metal instruments, a temperature of 121 degree Celsius is used.

For identified high-risk patients' instruments, prion test needs to be used during sterilisation to ensure that the instruments, materials, and surfaces in a dental autoclave have been exposed to the specific and effective sterilisation cycle.

3.6 Monitoring sterilisation cycle:

Monitoring of the sterilisation cycles must be performed to achieve effective sterilisation. Monitoring includes physical monitoring, biological and chemical monitoring.

- a) Physical monitor: Monitoring the temperature, pressure and time for every cycle verifies that the process has initiated. However, the initiation of sterilisation process by physical monitoring does not necessarily verifies that instrument has completed sterilisation process. Therefore, biologic monitoring must be performed.
- b) Biologic indicator: Biologic monitoring assesses the ability of the sterilisation process to kill highly resistant microorganism. For this purpose, biologic indicator is used. Vials or strips that contain harmless bacterial spores are exposed to the sterilisation cycle. There are test and control biologic indicator. The test should not yield positive result, while the control should yield positive result.

3.7 Distribution and storage

The instruments are then distributed to specified places such as polyclinic, surgery room and specialist clinic. Critical and semi-critical items need to be stored in an enclosed area. Exposure to the air will increase the risk for contamination. Packages must be inspected for barrier integrity and dated prior to storage. Packages that are stored with intact packages will remain sterile up to 6 months. If the packages are compromised, the instruments need to be re-cleaned, re-packaged and re-sterilised.

4. INFECTION CONTROL IN THE CLINIC

In dental practice, there is an increased risk of cross infection between patients and healthcare workers (students, lecturers, and auxiliaries). These guidelines outline the necessary steps to prevent cross infection and protect healthcare workers and their patients.

4.1 Personal protection care

All healthcare workers should comply to the recommendation by the Ministry of Health and Faculty of Dentistry, Dental Guideline Post COVID-19 before entering the clinic.

4.2 Dental clinic area

Dental clinic area is divided into

- a. Clinical contact surfaces
- b. Non-clinical contact surfaces

4.2.1 Clinical contact surfaces are surfaces that might become contaminated with blood or body fluid such as saliva during a dental procedure. Cleaning and disinfecting may minimise the microorganism's transferral between contaminated surfaces to other surfaces and to the patients and healthcare workers.

Operator working surfaces

- a. Dental chair and control panel
- b. Operator chair
- c. Spittoon
- d. Light handles
- e. Triple syringes
- f. Handpiece brackets
- g. End of suction hoses
- h. Amalgamators and curing light

Assistant working surfaces

- a. Work surfaces
- b. Drawer handles
- c. Assistant chair

4.2.2 For cleaning of the surfaces, these are the disinfectants that can be used

a. Low level disinfections

A process that inactivates the majority of vegetative bacteria, certain fungi, and certain viruses, but cannot be relied on to inactivate resistant microorganisms (e.g.: mycobacteria or bacterial spores)

b. **Intermediate level disinfectants**

A disinfection process that inactivates vegetative bacteria, majority of fungi, mycobacteria, and the majority of viruses particularly enveloped viruses, but not bacterial spores.

Principles of surface disinfectants

- a. Should not be sprayed directly onto surfaces as this causes aerosolization of disinfectant.
- b. Must be allowed to remain on the surface for a sufficient amount of time.
- c. Must clean the organic matter as it may interferes with the disinfectants.

4.2.3 Non-clinical contact surfaces

Non-clinical contact surfaces, for example, floors, walls, door handles etc, have limited risk of disease transmission. Therefore, cleaning is less rigorous than those used for clinical contact surfaces.

4.2.3.1 Floor

Surgery area	General/ common area
Clean twice daily with detergent and water	Clean once a day
At the beginning AND at the end of the day	At the beginning OR at the end of the day

Table 2: Frequency of cleaning of floor in the faculty.

Different mops and cleaning cloths are used for the surgery, general areas, and toilet to maintain the cleanliness of each area.

4.2.3.2 Door handles and lifts

Door handles and lifts including the lift's button should be cleaned with detergent and water once a day.

4.3 Dental unit waterlines

Dental units should have a separate water reservoir system to supply water or an in-built filtration system to the handpieces and scalers.

Methods for cleaning waterlines

- a. Flush waterlines for a minimum of two minutes each morning.
- b. Flush waterlines with handpieces attached for 20 to 30 seconds between each patient.

4.4 Dental handpieces and other detachable devices attached to air and waterlines

Methods for cleaning:

- a. Flush handpieces while still attached to air/ waterlines with bur inserted between each patient.
- b. Clean visible debris and dry the handpieces.
- c. Flush the handpieces with lubricant.
- d. Pack and send to autoclave.

4.5 Suction units (aspirators), spittoons and secretion filters

Methods for cleaning:

- a. Suction lines should be flushed between patients and intermittently during long procedures.
- b. At the end of each day, suck a non-foaming detergent through the high and low volume aspirators.
- c. Then, flush a non-foaming detergent through the spittoon.
- d. Secretion filters must be cleaned daily.

Flow	Person in charge
Before each session/ treatment	
Operator working surfaces (except spittoon) must be covered with barrier protection film/ plastic	Assistant
↓	
Flush waterlines for a minimum of two minutes	Operator
↓	
Ensure that all instruments and equipment to be used is cleaned or adequately disinfected	Operator
↓	
Arrange instruments and materials to be used systematically and in the appropriate location	
↓	
Start of treatment	
During treatment	
Wash hands before gloving; a new pair of gloves must be used for each patient	Operator
↓	
Provide a bib or drape and eye protection for the patient	Assistant
↓	
Avoid contact with non-working surfaces once treatment has commenced	Operator
↓	
Four handed techniques for infection control	Operator/ Assistant

Figure 4: Protocol for students' clinic before and during treatment.


Flow	Person in charge	
After treatment/ In between patients		
<div style="border: 1px solid black; padding: 5px; text-align: center;">Remove the barrier protective film/plastic</div> <div style="text-align: center; margin: 5px 0;">↓</div>	Operator/ assistant	
<div style="border: 1px solid black; padding: 5px; text-align: center;">Dispose sharps and clinical waste in the designated containers</div> <div style="text-align: center; margin: 5px 0;">↓</div>		Operator/ assistant
<div style="border: 1px solid black; padding: 5px;"> <p>Clean the clinical contact surfaces. The disinfection of surfaces should follow these steps:</p> <ul style="list-style-type: none"> • Start at the least contaminated surfaces and proceed to the most contaminated one. • Start at the top and move downwards. </div> <div style="text-align: center; margin: 5px 0;">↓</div>		
<div style="border: 1px solid black; padding: 5px; text-align: center;">Flush all air, suction and waterline</div> <div style="text-align: center; margin: 5px 0;">↓</div>		Assistant
<div style="border: 1px solid black; padding: 5px; text-align: center;">Prepare the dental unit for the next patient</div>		
At the end of each day		
<div style="border: 1px solid black; padding: 5px; text-align: center;">Dispose all clinical waste appropriately</div> <div style="text-align: center; margin: 5px 0;">↓</div>		
<div style="border: 1px solid black; padding: 5px;"> <p>Clean the clinical contact surfaces. The disinfection of surfaces should follow these steps:</p> <ul style="list-style-type: none"> • Start at the least contaminated surfaces and proceed to the most contaminated one. • Start at the top and move downwards. </div> <div style="text-align: center; margin: 5px 0;">↓</div>		
<div style="border: 1px solid black; padding: 5px; text-align: center;">Flush all air, suction, and waterlines for a minimum of 2 minutes</div> <div style="text-align: center; margin: 5px 0;">↓</div>		
<div style="border: 1px solid black; padding: 5px; text-align: center;">Clean the spittoon and secretion filters thoroughly</div>		

Figure 5: Protocol for students' clinic after treatment and at the end of the day

4.6 Checklist monitoring

All operators need to fill up this checklist form at the end of each session every day. Then, the assigned clinical staff will sign the form in order to make sure every cleaning and maintaining step has been followed accordingly.

USIM-FPg-SS-05



UNIVERSITI SAINS ISLAM MALAYSIA
 جامعة العلوم الإسلامية الماليزية
 ISLAMIC SCIENCE UNIVERSITY OF MALAYSIA

SENARAI SEMAK PENYELENGGARAAN UNIT/KERUSI PERGIIGIAN DI POLIKLINIK

HARIAN

(Tandakan (✓) setelah dilaksanakan) **BULAN :** **TAHUN :**

Tarikh	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Catatan		
Peralatan																																		
Dental Unit Cum Chair																																		
Micromotor																																		
Handpiece																																		
Scaling Unit																																		
Dental stool																																		
Portable Suction Unit																																		
Spitton: bersihkan dengan menuangkan 2 liter air																																		
Working table																																		
Laptop																																		
Nama Pelajar																																		
Nama Penyelia																																		

Sekiranya tiada rawatan dijalankan penyelenggaraan dilakukan sekurang-kurangnya sekali seminggu

Figure 6: Dental Unit Daily Checklist

4.7 Guidelines for oral healthcare practitioners with blood-borne and air-borne microbes

The Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), COVID-19 Virus and mycobacterium tuberculosis may spread within the dental clinic. There is a recognized risk of transmission of HIV, HBV, HCV, Mycobacterium Tuberculosis and COVID-19 Virus between patients and healthcare workers. The risk of transmission from patients to healthcare workers is greater than the reverse.

Infection control in dentistry focuses on **standard precautions** to reduce the risk of transmission of pathogens in blood and other body fluids between oral healthcare workers and patients.

Standard precautions are based on the concept that all blood and body fluids, secretions and excretions except sweat be treated as infectious when it comes into contact with non-intact skin and/or mucous membranes.

Patient with Tuberculosis must not be in an active disease state for any elective dental procedure.

4.7.1 Standard precautions

- a. Hand washing – use the correct technique, before and after each patient and before putting on and after removing gloves.
- b. Gloves – should be worn and must be changed between patients.
- c. Prevent injury to hands.
- d. Non-intact skin must be covered with waterproof dressings.
- e. Personal protective equipment must be used. Open footwear should not be worn.
- f. Approved procedures must be followed for
 - treatment room disinfection after each patient.
 - sterilization and disinfection of instruments and equipment
 - safe disposal of contaminated waste.
- g. All oral healthcare workers should be vaccinated against Hepatitis B.

4.7.2 The responsibilities of employers and training institutions

Universities shall ensure that their students are briefed on these guidelines. Each training establishment should nominate an officer (Clinic Matron) with whom students may discuss their concerns regarding their infected patients and oral healthcare workers. In addition, all students should be appropriately trained in procedures and precautions to minimise the risk of occupational transmission.

4.7.3 Protective measures

Protection can be achieved by a combination of immunisation procedures, use of barrier techniques and strict adherence to routine infection control procedures.

- a. Immunisation – dental healthcare workers are advised to be immunized against HBV unless immunity from natural infection or previous immunization had been documented.
- b. Protective coverings
 - gowns or aprons should be worn during procedures.
 - gloves must be worn for procedures. Any cuts or abrasions should be covered with adhesive waterproof dressings.
 - protective glasses, masks or face shields should be worn.
- c. Sharp instruments and needles – needles should never be recapped by using both hands in direct contact or by any other technique that involves moving the point of a used needle towards any part of the body. The needle can be recapped by laying the cap on the tray, placing the cap in a re-sheathing device, or holding the cap with forceps before guiding the needle into the cap.
- d. First aid and inoculation injuries – the wound should be encouraged to bleed and washed thoroughly with running water.

4.7.4 Instrument sterilisation

- a. All instruments should be cleaned thoroughly before sterilisation by rinsing and scrubbing with detergent and water.
- b. Heavy duty gloves, face protection shield should be worn.
- c. Instruments must be sterilized in an autoclave or hot air steriliser.

- d. Instruments which do not penetrate tissues should be sterilized by heat or disinfected by immersion in 2% glutaraldehyde solution in a closed container.
- e. Handpiece, ultrasonic scaler inserts/tips and air-water syringe tips should be flushed for 30 seconds, dismantled, cleaned, oiled and autoclaved between patients.

4.7.5 Surface disinfection

Work surfaces should be thoroughly cleaned and decontaminated with ethyl alcohol (70%). If there is visible blood, the surface should be cleaned and disinfected with sodium hypochlorite (0.5%) followed by water rinse. Protective gloves should be worn.

4.7.6 Aspiration and ventilation

The tubings of high-volume aspirators and saliva ejectors should be flushed with water between patients and with disinfectant sodium hypochlorite 0.1%.

4.7.7 Disposal of waste

Sharp items should be placed into puncture proof containers which should be securely sealed. Together with all medical waste must be disposed of in yellow bags, securely fastened.

4.7.8 Additional precautions

- a. Schedule the patient at the end of the list.
- b. The operator should wear two pairs of gloves. Plastic gown and protective eye wear should be worn.
- c. Try to minimize the formation of droplets, splatter, and aerosols, utilizing high volume vacuum aspirators and rubber dams.
- d. Avoid the use of instruments which cannot be easily decontaminated.

4.7.9 Standard Operating Procedure for Handling High-Risk Patients in the Dental Clinic

Student's Clinic

Before clinic

Operator

1. Inform Clinic Matron **AND** Polyclinic Staff at least 1 day before.
2. Inform Clinic Supervisor before the start of the procedure.
3. Polyclinic staff will rearrange the cubicle to be used in a suitable location to minimize the risk of infection spread.
4. For infectious disease with possibility of spread through aerosol, use a closed treatment room.
5. Make sure ample amount of time given to schedule the next patient's appointment using the same cubicle or treatment room in order to complete the disinfection process. Preferably patient is given appointment as the last patient of the day.

During clinic

Operator and Assistant

1. Operator and assistant must wear proper personal protective equipment including head cover, boot cover, non-woven gown, CFE Plastic apron, N95 mask and face shield with double gloving.
2. Use disposable instruments as many as possible depends on the availability.
3. Use plastic cover where indicated and cover computer and keyboard and other equipment available. If other sharing equipment is needed in the cubicle during treatment, make sure the equipment is disinfected properly before sending it out from the cubicle.
4. Operator and assistant are not allowed to leave their cubicle/room and must arrange for runner to be available outside the cubicle/treatment room. Only operator, assistant and supervisor are allowed in the treatment room.
5. For infectious disease with possibility of spread through aerosol, high volume suction is mandatory, and treatment must be done with the door closed.

Supervisor

1. Supervisor must wear a CFE plastic apron on top of the PPE worn during their supervision of the designated cubicle. CFE Plastic apron must be left in the cubicle when leaving the cubicle/room and can be re-use upon re-entering.

After clinic

Operator and assistant

1. Soak all non-disposable instruments into recommended disinfectant (**Refer Appendix A**). Operator/ assistant need to make sure that the instruments are soaked in a separate container from healthy patients.
2. Operator and assistant remove the plastic apron and change to new gloves before cleaning and disinfecting the cubicle thoroughly including the tabletop and all other surfaces.
3. Cubicle/ treatment room must be left empty for at least **6 hours/ overnight**.
4. Operator and assistant can remove all PPE after completing the disinfection process.
5. Discard all disposable items including PPE into the yellow bag and all sharp instruments into the sharp bin. Yellow bag must be tied closed properly and disposed as soon as possible and **MUST NOT** be left in the cubicle or treatment room.
6. Cubicle/ treatment room must be labelled "**IN ISOLATION**" until isolation time completed.

Out-Patient/Specialist Clinic

Before clinic

1. Clinical Staff in charge must inform Clinic Matron at least 1 day before.
2. For infectious disease with possibility of spread through aerosol, use a closed treatment room.
3. Make sure ample amount of time given to schedule the next patient's appointment using the same treatment room in order to complete the disinfection process. Preferably patient is given appointment as the last patient of the day.

During clinic

1. Operator and assistant wear proper personal protective equipment including head cover, boot cover, non-woven gown, plastic apron, N95 mask and face shield with double gloving.
2. Use disposable instruments as many as possible depends on the availability.
3. Use plastic cover where indicated and cover computer and keyboard and other equipment available. If other sharing equipment is needed in the treatment room during treatment, make sure the equipment is disinfected properly before sending it out from the room.
4. Operator and assistant are not allowed to leave their treatment room and must arrange for runner to be available outside the treatment room. Only operator and assistant/s are allowed in the treatment room.
5. For infectious disease with possibility of spread through aerosol, high volume suction is mandatory, and treatment must be done with the door closed.

After clinic

1. Soak all non-disposable instruments into recommended disinfectant (**Refer Appendix A**). Operator/ assistant need to make sure that the instruments are soaked in a separate container from healthy patients.
2. Assistants remove the plastic apron and change to new gloves before cleaning and disinfecting the room thoroughly including the tabletop and all other surfaces.
3. Treatment room must be left empty for at least for at least **6 hours/ overnight**.
4. Operator and assistant can remove all PPE after completing the disinfection process.
5. Discard all disposable items including PPE into the yellow bag and all sharp instruments into the sharp bin. Yellow bag must be tied closed properly and disposed as soon as possible and **MUST NOT** be left in the treatment room.
6. Treatment room must be labelled "**IN ISOLATION**" until isolation time completed.

5. INFECTION CONTROL FOR THE RADIOGRAPHY AREA

In the radiography area, the main risk for cross infection is from patient via direct contact or via contamination of work areas (indirect contact). Therefore, oral healthcare workers have a legal duty to prevent cross-contamination even though radiography is regarded as non-invasive procedures.

Standard precautions need to be taken for unidentified cases or non-specified cases during intra-oral imaging such as:

- Use non-powdered gloves
- Use a sterile film holder and apply dental barrier envelope
- Do not insert operator finger in patient's mouth during holder insertion
- Discard envelope after use and wash holder under running tap water
- Disinfect holder before the next use

Whereas for identified high risk patients (with known HIV, Hepatitis B or C infection) these precautions need to be taken:

- Plastic cover applied to tube head, control panel, headrest, and switches
- Use double glove and disposable PPE
- Use dental barrier envelope to guard against contamination
- Holder used can be either disposable or autoclavable receptor- holder
- Use disposable apron on the lead apron
- Dispose plastic cover after procedure, disinfect the dental chair, x-ray tube, lead apron and other work surfaces should be disinfected and left to dry for 10-15 minutes.

6. EXPOSURE INCIDENTS

An exposure incident is defined as a percutaneous injury or any contact of non-intact skin, eye, mouth, or other mucous membrane with blood or body fluid or tissue that are potentially infectious to the OHCW. This exposure might place them at risk of acquiring a blood borne infection such as human immunodeficiency virus (HIV), hepatitis B (HBV) or hepatitis C (HBC) infection from the patient. Therefore, immediate evaluation and treatment of the exposure site should be carried out by qualified healthcare professionals.

6.1 Types of exposure incidents:

- Percutaneous/penetrating injury (e.g., needles, burs, scalpel blades, etc).
- Contact of non-intact skin with blood, tissue, or body fluids.
- Contact of intact mucous membrane with blood, tissue, or body fluids.
- Bites or scratches inflicted by patients.
- Contact of intact skin with blood when:
 - i) the duration of contact is prolonged (e.g., several minutes or more)
 - ii) it involves an extensive area.

6.2 Prevention Strategies

6.2.1 Administrative Measures

- The faculty will provide education, training and briefing on standard operating procedures (SOP) to all year 3 students during the introduction year into clinical years and to all new clinical staff entering the faculty. Regular teaching or briefing will be given to all clinical staff regarding the SOP.
- An individual person who is knowledgeable in infection control guidelines and recommendations should be assigned responsibility in managing the exposure control and prevention programme.

6.2.2 Work Practice Controls

- All OHCW should follow work procedures or guidelines to reduce the likelihood of exposure incidents.
- All procedures involving blood, or any potentially infectious material must be performed in such a manner as to minimise splashing, spraying, spattering and droplets of these substances.
- All sharp instruments must be handled and used with care and techniques should be employed to minimise the risk of penetrating injuries

6.2.2.1 Before beginning a procedure:

- Equipment/instruments are arranged within arm's reach.
- There is adequate lighting and space.
- Sharps are pointed away from the operator.
- If a sharp is reusable, place in a safe area (e.g., in a tray or neutral zone).

6.2.2.2 During a procedure:

- Instruments should be arranged systematically during the procedure so that everyone is aware of the location of the sharp instruments.
- Sutures and blades are separated from the rest of the surgical set-up to ensure that they are very visible to prevent injury.
- When handling sharps, be aware of staff in the immediate environment.
- Minimise uncontrolled and forceful manipulation of sharp instruments.
- An instrument is used to retract tissue during any procedures and during anaesthetic injections.
- Pass instruments with sharp ends pointing away from all persons and announce instrument passes.
- Penetrative instruments e.g., Gates Glidden burs must be removed from handpieces immediately after use.
- Scaler tips of ultrasonic scalers should be sheathed or removed immediately after use.
- Needles must not be recapped unless using an approved recapping device. A one-handed scoop technique can be applied to recap a needle on a non-disposable anaesthetic syringe.

6.2.2.3 During clean-up:

- Visually inspect the areas containing waste materials used during the procedure for presence of sharps.
- Insert and remove all scalpel blades using a suitable instrument.
- All burs must be removed from handpieces before removing the handpieces from the dental unit to avoid percutaneous injury.
- Do not remove burs without cushioning the sharp edges with gauze or other materials to prevent gloves from being torn or punctured.
- Do not cut, bend, or remove needles by hand before disposal.
- Do not remove needles from disposable syringes.
- Transport reusable sharps in a secured container to prevent spillage of contents.

6.2.2.4 During disposal of sharps:

- The clinician using a disposable sharp item must be responsible for its use and disposal into a sharps bin after use.
- A separate sharps bin should be in each surgery room.
- Do not put fingers into the sharps bin. Use instruments to transport sharps into the sharps bin.
- Keep hands behind the sharp tip when disposing.
- If disposing of sharps with attached tubing (tubing can recoil and lead to injury) maintain control of the tubing.
- Sharps bin must be sealed when filled to the line marked on the bin or when three-quarters full.

6.2.2.5 After disposal

- Keep sealed sharps bins awaiting final disposal in a secure area.
- Replace sharps bins when they are three-quarters filled or up to a maximum of one week. Choose the appropriately sized bin depending on usage.
- If an improperly disposed sharps is encountered in the work environment, handle the sharp object carefully, with an instrument if possible.

6.3 Management of an exposure incident at the dental clinic.

6.3.1 Treatment of the exposure site.

- Decontaminate the exposure site immediately:
 - i. Wounds and skin sites - wash with soap and water.
 - ii. Mucus membranes - flush with water.
 - iii. Eyes - rinse gently and thoroughly with water or normal saline, with eyes open.
- There is no evidence that use of antiseptics or expressing fluid by squeezing the wound further reduces the risk of transmission of blood-borne pathogens.
- If the procedure that is being carried out at the time of the exposure must be completed - cover the injured site on the hand with a dressing before wearing gloves.
- Inform the location supervisor or lecturer of the incidents. The location supervisor/lecturer will subsequently inform the Sharp Injury Person in charge (SIPIC).
- Refer to Director of *Pusat Kesihatan Universiti (PKU)*.

6.3.2. Collection of Information

- Each exposure incident must be reported to enhance the effectiveness of post exposure treatments as well as to allow preventative measures to be taken if needed.
- Important information needs to be collected and the following forms must be filled in:
 - i. OSHA USIM Complaint Form (Need to be submitted to the OSHA department). (Appendix B)
 - ii. Sharp Injury Surveillance Form (To be kept as faculty record). (Appendix C)

Management of Sharp Injury/Exposure to Blood

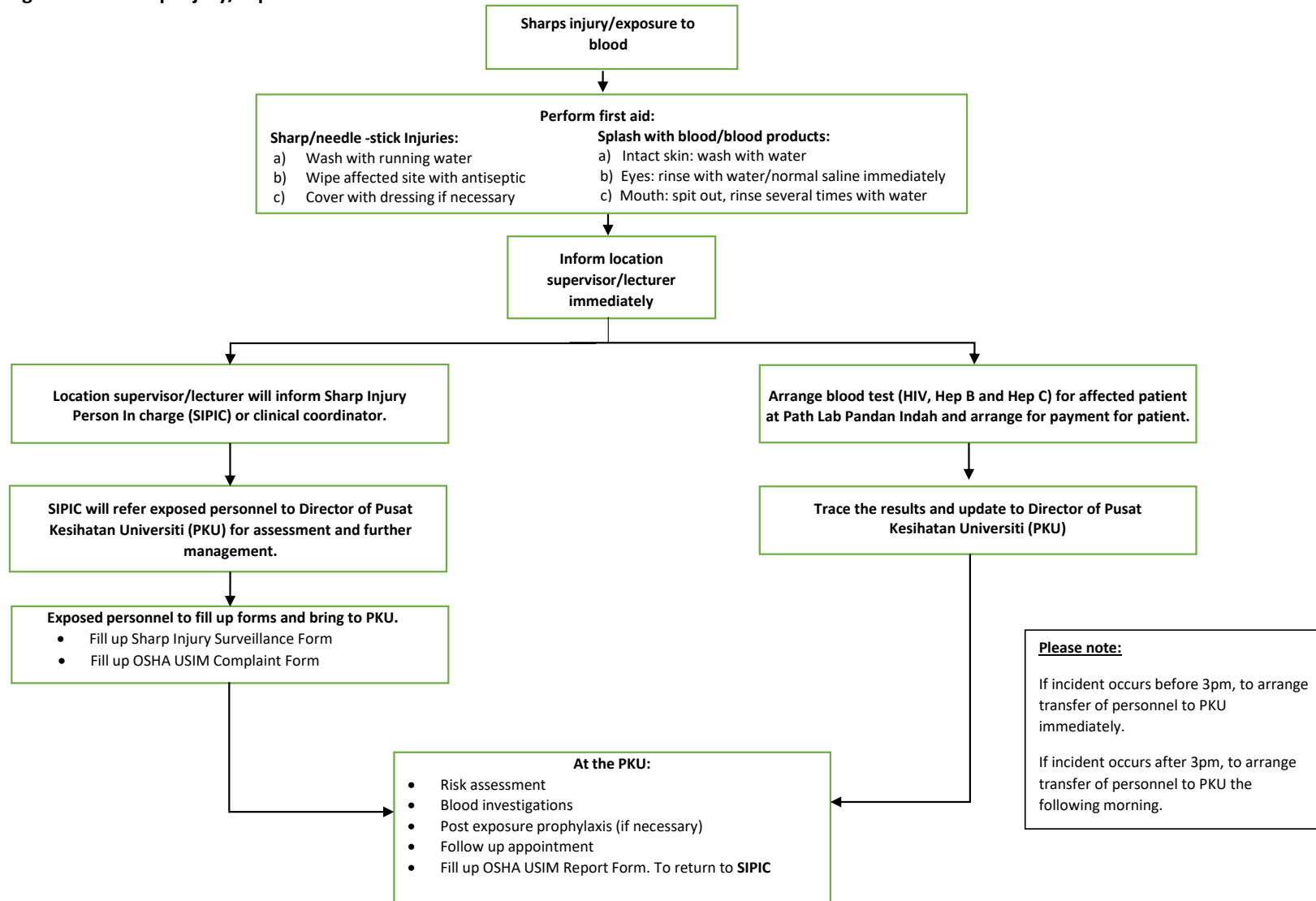


Figure 7: Flowchart on management of sharp injury and exposure to blood.

7. CLINICAL WASTE MANAGEMENT

7.1 Clinical and General Waste

Clinical waste is defined as waste arising from healthcare procedures, which by nature of its potentially infectious, toxic, or dangerous content may prove to be hazardous unless rendered safe and inoffensive. It includes any waste which consists wholly or partly of human or animal tissue, blood or other body fluids, excretions, drugs or other pharmaceuticals products, swabs or dressings, needles, or other sharp instruments.

General waste is all other waste and includes waste from offices, corridors, and public areas.

7.2 Segregation of Waste

Waste in healthcare establishments should be segregated according to its category at source and placed in the appropriate colour-coded bags/containers (Table 3).

Clinical waste	Yellow bags with 'Biohazard' label
Sharp instruments and objects	Yellow puncture resistant and leak proof containers with a biohazard label
General waste	Black bags

Table 3: Categories of Waste

7.3 Disposal Methods

Dispose waste according to regulations under the Environmental Quality Act 1974 (Act127) and the following legislations made under it:

- Environmental Quality (Scheduled Waste) Regulations 1989
- Environmental Quality (Prescribed Premises) (Scheduled Wastes Treatment and Disposal Facilities) Regulations 1989
- Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987; and x Environmental Quality (Clean Air) Regulations 1978

7.3.1. Solids

Waste bin lined with yellow, leak proof plastic bag, which is sealed when three quarters full. Dispose according to regulations under the Environmental Act 1974.

7.3.2. Fluids (blood/body fluids/suctioned fluids)

All fluid waste must be disposed directly into the sewer system and not into open drains.

7.3.3. Sharps

All sharps must be disposed into yellow Sharps Bins. When the Sharps Bin is two thirds full, it must be sealed and sent for incineration according to regulations under the Environmental Act 1989.

7.3.4. Broken Instruments

Broken instruments and endodontic files should be disposed as sharps.

7.3.5. General Waste

General waste should be disposed in black plastic bags.

7.3.6 Disposal of X-ray solutions and Disinfectants

X-ray solutions and disinfectants should be disposed into the sewerage system. However, it should be ensured that the disinfectants used are biodegradable.

7.4 Management of waste

All of the waste bags are gathered on the 8th floor of the building in their containers and collected by the disposal company on a weekly basis.

8. MANAGEMENT OF LAB EQUIPMENT

8.1 Dental Laboratory Materials

Dental laboratory materials and other items (e.g., impressions, bite registration, fixed and removable prostheses, orthodontic appliances) are potential sources of cross-infection and should thus be handled appropriately.

- Items bound for the laboratory such as impressions, prosthetic appliances etc., should be first cleaned to remove saliva, blood, and debris. The items are then disinfected appropriately using intermediate level disinfectant spray (Medaprint foam or Aseptoprint spray). The cleaning and disinfection must be done in the clinic. Containers or plastic bags should be used for transportation of these items. PPE should be used at least until the items have been disinfected.
- Items from the Outpatient clinic or Specialist clinic need to be placed at the designated receiving area at the laboratory.
- Laboratory items that become contaminated but do not normally contact the patient (e.g., burs, polishing points, rag wheels, articulators, case pans, and lathes) should be cleaned and disinfected using the instrument disinfectant.
- The laboratory machine surfaces need to be disinfected with surface disinfectant.
- Dental laboratory technician and students using the lab must ensure that hand hygiene is being practiced and appropriate PPE (glove, mask, and blue gown) must be used when handling dental laboratory materials.

Appendix A**Active substance in 100g**

5g of alkyl-di-methyl-ethyl-ammonium-ethyl sulfate, 1g of polyhexamethylene hydrochloride, 1.8g of cocosporylenguanidinium diacetate.

Application

CONCENTRATION	CONTACT TIME
Bactericidal, yeasticidal, tuberculocidal	
2%	60 min
3%	30 min
4%	15 min
Virus efficiency	
BVDV: 2%	15 min
Vaccinia (including HBV, HCV, HIV): 2%	60 min
Vaccinia (including HBV, HCV, HIV): 4%	15 min



UNIVERSITI SAINS ISLAM MALAYSIA
 جامعة العلوم الإسلامية الماليزية
 ISLAMIC SCIENCE UNIVERSITY OF MALAYSIA

**UNIT KESELAMATAN DAN KESIHATAN PEKERJAAN
 UNIVERSITI SAINS ISLAM MALAYSIA**

**BORANG LAPORAN PERUBATAN KEMALANGAN, KERACUNAN PEKERJAAN DAN PENYAKIT
 PEKERJAAN**

2. PANDUAN PELAPORAN

- i. Sila isi laporan ini dimana yang berkenaan. Gunakan lampiran jika ruang yang disediakan tidak mencukupi.
- ii. Anda perlu mengisi laporan ini dengan jujur dan ikhlas. Keterangan yang diberikan akan membantu Jawatankuasa mengambil langkah - langkah pencegahan bagi mengelakkan kemalangan tersebut daripada berlaku di masa hadapan
- iii. Laporan yang telah siap diisi hendaklah dikemukakan kepada Unit Keselamatan dan Kesihatan Pekerjaan.

2. BUTIRAN MANGSA	
Nama	:
No. Kad Pengenalan	: No.Pekerja / No.Matrik :
Bangsa	: Warganegara :
Pusat Tanggungjawab	:
E-mail	: No. Telefon :
Alamat	:
	:
Pekerjaan (staff/pekerja kontrak dll)	: Majikan :
Kursus (pelajar)	: Tahun :
Tempat Kejadian	:

3. RAWATAN
Jenis dan Tahap Kecederaan/Keracunan/Penyakit Pekerjaan :
.....
.....
.....
Rawatan yang Diberikan :
.....
.....
.....
Cuti Sakit (Jika diberikan) : Dari
Hingga
Tarikh Rawatan :

4. PERAKUAN PEGAWAI PERUBATAN
Saya mengaku segala keterangan yang diberikan adalah benar.
Tandatangan dan Cap Pegawai Perubatan :
.....
Nama :
Masa :
Tarikh :

APPENDIX C

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USIM/FPg/CLINIC/INF/08/2016



**SHARP INJURY SURVEILLANCE
INFECTION CONTROL UNIT
FACULTY OF DENTISTRY, USIM**



**NOTIFICATION AND MANAGEMENT OF POST OCCUPATIONAL EXPOSURE
TO SHARP INJURY**

Instruction :

This section is to be completed by location supervisor or injured person.

A. Particulars of exposed person

(Please tick (/) where applicable)

1. Name : _____

2. Gender : Male Female

3. ID number : _____

4. Age : ___ years old

5. Staff category :

<input type="checkbox"/> Specialist	<input type="checkbox"/> Dental Surgery Assistant
<input type="checkbox"/> Dentist	<input type="checkbox"/> Dental Attendant
<input type="checkbox"/> Undergraduate	<input type="checkbox"/> Laboratory Technician
<input type="checkbox"/> Postgraduate	<input type="checkbox"/> Laboratory Technologist
<input type="checkbox"/> Staff Nurse	<input type="checkbox"/> Others : _____

B. Detail of exposure/incident

(Please tick (/) where applicable)

1. Time of injury : _____ AM/PM

2. Date of injury : _____

3. Instrument causing the injury :

<input type="checkbox"/> LA needle	<input type="checkbox"/> Elevators
<input type="checkbox"/> Suture needle	<input type="checkbox"/> Microtome blade
<input type="checkbox"/> Scalpel blade	<input type="checkbox"/> Trocar
<input type="checkbox"/> Pipette	<input type="checkbox"/> Specimen/test tube
<input type="checkbox"/> Scissors	<input type="checkbox"/> Wire
<input type="checkbox"/> Electrocautery	<input type="checkbox"/> Pin
<input type="checkbox"/> Bone cutter	<input type="checkbox"/> Drill bit/bur
<input type="checkbox"/> Lancet	<input type="checkbox"/> Others : _____

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4. Location :
- | | | | |
|--------------------------|-------------------|--------------------------|-------------------------|
| <input type="checkbox"/> | Outpatient clinic | <input type="checkbox"/> | Dental Laboratory |
| <input type="checkbox"/> | Specialist clinic | <input type="checkbox"/> | Microbiology Laboratory |
| <input type="checkbox"/> | Polyclinic 16 | <input type="checkbox"/> | CSSD/Utility room |
| <input type="checkbox"/> | Polyclinic 17 | <input type="checkbox"/> | Operation Theatre |
| <input type="checkbox"/> | X-ray room | <input type="checkbox"/> | Others : _____ |

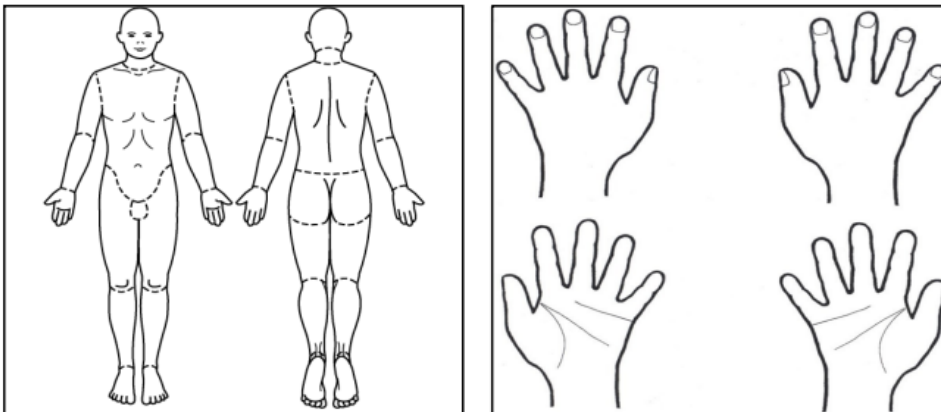
5. Was the injured worker is the original user of the sharp item?
- Yes
- No (please continue to question 6)

6. What was the purpose of using the sharp item?
- | | | | |
|--------------------------|-------------------|--------------------------|----------------|
| <input type="checkbox"/> | LA injection | <input type="checkbox"/> | Cutting |
| <input type="checkbox"/> | Obtain body fluid | <input type="checkbox"/> | Drilling |
| <input type="checkbox"/> | Suturing | <input type="checkbox"/> | Electrocautery |
| <input type="checkbox"/> | Extraction | <input type="checkbox"/> | Others : _____ |

7. Sharp item features :
- Contaminated. Blood visible on the instrument? Yes/No
- Untaminated
- Unknown

8. When did the injury occur?
- | | | | |
|--------------------------|-----------------------|--------------------------|-------------------|
| <input type="checkbox"/> | Before use | <input type="checkbox"/> | During disposable |
| <input type="checkbox"/> | During procedure | <input type="checkbox"/> | After disposal |
| <input type="checkbox"/> | In between procedure | <input type="checkbox"/> | Others : _____ |
| <input type="checkbox"/> | Disinfect/sterilizing | | |
| <input type="checkbox"/> | Recapping needle | | |

9. Mark the location of the injury.



10. How deep was the injury?
- Superficial (little or no bleeding)
- Moderate (skin punctured, some bleeding)
- Severe (deep cut, profuse bleeding)

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C. Status of the source patient

(Please tick (/) where applicable)

1. Patient's particular : known unknown

2. Occupation : _____

3. Nationality : _____

4. Sexual orientation : Heterosexual
 Bisexual
 Homosexual

5. Sexual contact with : Sex worker
 Multiple sex partners

6. History of intravenous drug use : Yes No

If YES, any history of needle sharing : Yes No

7. Serostatus of source patient

HIV	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> Unknown
Hepatitis B	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> Unknown

I hereby certify that the above informations are accurate and no information withheld.

Signature,

.....

Name :

Date :

REFERENCES

1. Guidelines on Infection Control in Dental Practice. February 2017. Malaysian Dental Council (MDC).
2. Guidelines on Management of Health Care Workers (HCW) Infected with Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), Hepatitis C Virus (HCV). December 2007. Occupational Health Unit, Ministry of Health Malaysia.
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5. Policies and Procedures on Infection Prevention and Control. 2019. Medical Care Quality Section, Medical Development Division, Ministry of Health Malaysia.