

**Guide to Infection Control  
In Clinic Setting  
Draft as at March 2018**

**Infection Control Branch, Centre for Health Protection,  
Department of Health**

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## **1. Introduction**

All healthcare settings, regardless of the level of care provided, must make infection prevention and control a priority. The Guide to Infection Control in Clinic Setting (“the Guide”) serves to provide guidance to healthcare personnel on prevention and control of infection in clinic settings. In this document, “clinic” refers to any facility providing medical and dental services to outpatients.

## **2. Scope**

This guide focuses on fundamental infection prevention and control measures and is intended for use as a general guidance. One must exercise judgment in applying this guide for their own particular circumstances and seeks professional / expert advice where appropriate. It should also be read in conjunction with other infection control guidelines / recommendations promulgated by the Department of Health and professional bodies. Infectious diseases and infection control related guidelines promulgated by Department of Health can be accessed at [http://www.chp.gov.hk/en/guideline\\_infection/346.html](http://www.chp.gov.hk/en/guideline_infection/346.html).

## **3. Key Fundamental Elements**

### **3.1. Facility design**

- 3.1.1 All areas should be designed, constructed, furnished and equipped to minimize the risk of transmitting infection, and facilitate implementation of infection prevention and control measures.
- 3.1.2 The principles of separation of clean and dirty items and unidirectional flow maintaining all items from dirty to clean zone should be observed. The following areas should be divided and clearly delineated from each other: cleaning, preparation and packaging, sterilization, storage.

### **3.2. Risk assessment and management**

The management of the clinics should conduct risk assessment in respect of infection prevention and control, and ensure that relevant staff should understand their responsibility and competence in managing the identified risks.

### **3.3. Roles and responsibilities**

The management should ensure that safe systems of work are in place. The key responsibilities in respect of infection prevention and control are as follows:

- i. To develop infection prevention and control policies and plans based on the identified risks.
- ii. To identify and appoint a person with relevant training and experience to oversee the overall infection control practice in the clinic.
- iii. To provide relevant education and training and ensure policies and procedures are known to all relevant staff.
- iv. To put in place mechanisms for identification, reporting and managing work-related incidents in respect of infection control.
- v. To take all reasonable steps to protect staff from work-related diseases.
- vi. To monitor the implementation of safe systems of work, e.g. an infection control checklist ([Appendix 1](#)) can be used as an audit tool for monitoring.
- vii. To comply with relevant legislation and reporting requirements.

### **3.4. Education and training**

3.4.1 Effective education and training program should be provided to frontline staff to ensure appropriate infection prevention and control practices are followed, including but not limited to the following:

- i. Provision of up-to-date information, including infection prevention and control policy, infection control basic principles and related work practices, incident management, and role of staff in preventing the spread of infections.
- ii. Provision of related education and training:
  - a) upon induction and orientation;
  - b) repeated regularly; and
  - c) at any time when information has been updated or revised.

3.4.2 Examples of training information can be retrieved from:

- i. The Centre for Health Protection (CHP), Department of Health at <http://www.chp.gov.hk>
- ii. Hong Kong Training Portal on Infection Control and Infectious Disease, Hospital Authority and Department of Health at <http://icidportal.ha.org.hk>
- iii. Occupational Safety and Health Council (OSHC) at <http://www.oshc.org.hk>

### **3.5. Protection of staff health and safety**

The management should provide and maintain safe systems of work that are, as far as reasonably practicable, safe and without risks to health of the staff. Infection control measures for occupational safety include but not limited to standard precautions and transmission-based precautions as appropriate (e.g. appropriate and correct use of personal protective equipment (PPE) and hand hygiene), handling of sharps, sickness reporting and handling, and immunization. There should be mechanisms to monitor and ensure adherence to the relevant policies and procedures.

### **3.6. Surveillance and disease reporting**

The Prevention and Control of Disease Ordinance (Cap. 599) requires all registered medical practitioners to notify the Central Notification Office (CENO) of CHP of all suspected or confirmed cases of the statutory notifiable communicable diseases specified in the First Schedule. For the latest list of statutory notifiable diseases and the case definitions, please refer to CENO On-line website at [https://cdis.chp.gov.hk/CDIS\\_CENO\\_ONLINE/ceno.html](https://cdis.chp.gov.hk/CDIS_CENO_ONLINE/ceno.html).

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## 4. Principles of Infection Control in Clinics

There are two tiers of precautions to prevent transmission of infectious agents: **standard precautions and transmission-based precautions**. The first tier standard precautions are the minimum infection prevention practices that apply to all patients, regardless of their diagnosis and infectious status, in any setting where healthcare is delivered. The second tier transmission-based precautions are used in addition to standard precautions, where the suspected or confirmed presence of infectious agents represents an increased risk of transmission.

### 4.1. Standard precautions

Standard precautions define all the steps that should be taken to prevent spread of infection from person to person or from contaminated environmental surfaces / healthcare items, when there is an anticipated contact with:

- i. Blood
- ii. Body fluids
- iii. Secretions
- iv. Excretions, such as urine and faeces (excluding sweat) whether or not visibly contaminated with blood
- v. Non-intact skin, such as an open wound
- vi. Mucous membranes, such as the oral cavity

**Standard precautions consist of the followings:**

- perform hand hygiene
- use of personal protective equipment
- follow respiratory hygiene and cough etiquette
- ensure appropriate patient placement
- follow safe injection practices, sharps handling and disposal
- clean and disinfect environment appropriately
- reprocessing of reusable medical devices/instruments properly
- waste management
- handle linen carefully



## 4.2. Transmission-based precautions

4.2.1 Since the infectious agent is often not known at the time of encounter in clinic settings, transmission-based precautions are used empirically, according to the clinical syndrome and the likely etiologic agents at that time. Systems should be in place for early detection and management of potentially infectious patients which include prompt isolation, referral and transfer as appropriate.

4.2.2 There are three categories of transmission-based precautions: (1) Contact Precautions, (2) Droplet Precautions, and (3) Airborne Precautions. Transmission-based precautions are applied in addition to standard precautions and using appropriate types of PPE ([Appendix 2a & 2b](#)). For some diseases that can be transmitted in multiple ways, a combination of transmission-based precautions may be used. (Please also refer to Section 5.2 on the use of PPE)

### Contact precautions

- Apply to patients known or suspected to be infected or colonized with pathogens that can be transmitted through direct patient contact (hand or skin-to-skin contact that occurs during patient-care activities) or indirect contact of contaminated environmental surfaces or healthcare items
- Examples of infections transmitted by contact route include scabies, norovirus, methicillin resistant *Staphylococcus aureus* (MRSA), Vancomycin-resistant enterococci (VRE) and *Clostridium difficile*
- Gloves and gown should be worn during care of patients with suspected infections or contact with infected materials

### Droplet precautions

- Apply to patients known or suspected to be infected with pathogens that can be transmitted by droplet route. Droplet precautions prevent the spread of organisms that are transmitted by large droplet particles (sizes > 5 microns). These droplet particles, generated when patients cough, talk or sneeze, do not remain suspended in the air for extended periods of time, and can only be propelled over a short distance (usually within 1 meter) from patients
- Examples of infections transmitted by droplet route include influenza, Group A streptococcus, pertussis and rubella
- Surgical mask should be worn during care of patients with suspected infections within one meter distance

### **Airborne precautions**

- Apply to patients known or suspected to be infected with pathogens that can be transmitted by airborne route. Airborne precautions prevent diseases that are transmitted by airborne droplet nuclei (sizes  $\leq 5$  microns) containing microorganisms that can remain suspended in the air for a long period of time, or dust particles containing the infectious agent. Microorganisms carried in this manner can be dispersed widely by air current within a room or over a long distance. Special air handling and ventilation should be considered
- Examples of airborne infections are pulmonary tuberculosis, chickenpox, measles and disseminated herpes zoster. Airborne precautions should also be taken into consideration when performing procedures that have been reported to be aerosol-generating\* and associated with documented increased risk of respiratory infection transmission
- N95 respirator should be worn during care of patients with suspected airborne infections or when performing aerosol generating procedures. Dental procedures which are aerosol-generating, such as scaling and restorations, should be deferred in dental clinics if the patient is suspected to have airborne infections

**\*Remark:** Aerosol-generating procedures with documented increased risk of respiratory infection transmission are endotracheal intubation, cardiopulmonary resuscitation, bronchoscopy, open suctioning of respiratory tract (including tracheostomy care), autopsy and non-invasive positive pressure ventilation (BiPAP and CPAP). Aerosol-generating procedures with controversial / limited studies evaluating the risk of respiratory infection transmission are high-frequency oscillatory ventilation, nebulizer therapy and sputum induction. Nasopharyngeal aspiration (NPA) and high flow oxygen are theoretically at risk of dispersal of infectious respiratory droplets, therefore they should be performed in conditions as required for aerosol-generating procedures in high-risk patient areas.

## 5. Infection Control Measures

### 5.1. Hand hygiene

5.1.1 Good hand hygiene practice (use of alcohol-based hand rubs (ABHR) or hand washing with soap and water) is crucial in preventing spread of healthcare-associated infections and antimicrobial resistant microorganisms.

- i. Evidence showed that use of ABHR at the point-of-care (e.g. blood-taking trolley, consultation desk, triage station) would facilitate hand hygiene and increase compliance.
- ii. It is advisable to have hand washing facilities (preferably hands-free or elbow-operated) inside the consultation / examination rooms and treatment areas.
- iii. Encouraging hand hygiene practices among patients can also reduce the risk of infection transmission. Hand hygiene facilities should also be easily accessible to patients, such as placing ABHR at the reception counter and in the waiting room.
- iv. Clinics should take reference of the World Health Organization (WHO) resources on hand hygiene in healthcare setting at <http://www.who.int/gpsc/5may/tools/en/> and outpatient setting [http://www.who.int/gpsc/5may/hh\\_guide.pdf](http://www.who.int/gpsc/5may/hh_guide.pdf) to implement strategies and programs on hand hygiene.

#### 5.1.2 Indications for hand hygiene

The 5 key moments for hand hygiene advocated by WHO ([Appendix 3](#)) are:

- i. before touching a patient
- ii. before clean and aseptic procedures
- iii. after body fluid exposure risk
- iv. after touching a patient
- v. after touching patient surroundings

### 5.1.3 Hand hygiene technique

- i. Artificial nails, nail embellishments, watches, rings and other wrist jewelries should be avoided when having direct patient contact.
- ii. Hand hygiene can be achieved by rubbing hands with 70-80% alcohol-based formulation or washing hands with liquid soap and water. Soap and ABHR should not be used concomitantly.
- iii. It is preferable to use ABHR for routine hand hygiene if hands are not visibly soiled. Hands should be washed with liquid soap and water when visibly dirty, visibly soiled with blood or other body fluids or after using the toilet.
- iv. Hand washing with liquid soap and water is preferred after exposure to confirmed or suspected spore-forming pathogens, e.g. *Clostridium difficile*, or after contacting patients with hand, foot and mouth disease (HFMD) or diarrheal diseases (e.g. norovirus infection).
- v. ABHR and liquid soap should not be topped up. This practice can lead to bacterial contamination. If reusable container is used, it should be appropriately washed and dried thoroughly before refilling.
- vi. Surgical hand antisepsis should be performed using either suitable antimicrobial soap or suitable alcohol-based hand rub, preferably with a product ensuring sustained activity, before donning sterile gloves.

#### **Hand rubbing with 70-80% ABHR**

- Apply a palmful of ABHR (around 3-5ml) and cover all surfaces of the hands including palms, back of hands, between fingers, back of fingers, thumbs, finger tips and wrists
- Rub all hand surfaces for at least 20 seconds until hands are dry

#### **Hand washing with soap and water ([Appendix 4](#)) :**

- Wet hands with water and apply enough amount of liquid soap necessary to cover all hand surfaces
- Rub all surfaces of the hands for at least 20 seconds before rinsing under running water
- Dry hands thoroughly with paper towel or a hand dryer
- The whole procedure usually takes about 40-60 seconds
- Avoid using hot water for hand washing because repeated exposure to hot water may increase the risk of dermatitis

## 5.2. Personal protective equipment

5.2.1 There should be sufficient PPE appropriate for the work performed to enable adequate staff protection. The use of PPE, such as gloves, gowns, surgical masks, N95 respirators, goggles and face shields, provides a physical barrier between microorganisms and the user. It reduces anticipated exposure or exposure risk but does not eliminate the infectious hazard. Use of PPE does not replace basic infection control measures such as hand hygiene. The following should be observed for usage of PPE:

- i. Adequate stock of PPE should be available.
- ii. Selection of PPE should be based on risk assessment.
- iii. PPE should be stored in appropriate area with suitable temperature and humidity as recommended by manufacturers and free from dust, insects and vermin. They need to be examined for the expiry date and checked regularly to ensure integrity.

For more information on indications and recommended usage of PPE in standard precautions and transmission-based precautions, please refer to Appendices 2a and 2b.

### 5.2.2 Principles of PPE Removal

Doffing of used PPE requires strict adherence to PPE doffing procedure to protect staff from contamination. Used PPE should be treated as contaminated and should not be worn out of the workplace into non-clinical areas.

- i. Remove PPE in designated doffing area.
- ii. Do not doff together in close proximity to another person. PPE should be doffed slowly and deliberately in the sequence as suggested in the [http://www.chp.gov.hk/files/jpg/doffing\\_ppe\\_step\\_by\\_step.jpg](http://www.chp.gov.hk/files/jpg/doffing_ppe_step_by_step.jpg).
- iii. Perform hand hygiene according to steps of PPE doffing, or when hands get contaminated during doffing of PPE.
- iv. Remove PPE and wash hands thoroughly with liquid soap and water immediately whenever having substantial splashing or contaminated by blood or body fluids.

- v. Disposable PPE should be discarded in lidded waste receptacles properly after use.
- vi. Reusable PPE should be properly decontaminated according to the manufacturer instruction after use, and maintained.

5.2.3 Suggested sequence of donning and doffing PPE ([http://www.chp.gov.hk/files/jpg/donning\\_ppe\\_step\\_by\\_step.jpg](http://www.chp.gov.hk/files/jpg/donning_ppe_step_by_step.jpg) and [http://www.chp.gov.hk/files/jpg/doffing\\_ppe\\_step\\_by\\_step.jpg](http://www.chp.gov.hk/files/jpg/doffing_ppe_step_by_step.jpg))

Without jeopardizing the general infection control principles, the sequence may vary slightly according to local practice. For intact mucosal protection during doffing, removal of surgical mask / N95 respirator should be the last step, and hand hygiene should be performed before and afterwards.

### 5.3. Respiratory hygiene and cough etiquette

Respiratory hygiene and cough etiquette should be implemented at the initial point of encountering patients and accompanying persons with undiagnosed transmissible respiratory infections, or signs of illness including cough, congestion, rhinorrhea, or increased production of respiratory secretions when entering clinics. It includes the following:

#### **Education of staff, patients, and accompanying persons**

- The importance of infection control measures to contain respiratory secretions to prevent the spread of respiratory pathogens when there are signs and symptoms of respiratory infection, which include:
  - cover mouth and nose when coughing or sneezing
  - use tissue paper to contain respiratory secretions and dispose it in lidded receptacles
  - perform hand hygiene after hands have been in contact with respiratory secretions
  - advise persons with respiratory symptoms to wear surgical masks, especially during epidemic periods

#### **Visual alerts**

- Display visual alerts such as posters and banners in conspicuous positions (e.g. at the entrance). State in language(s) appropriate to the population served, to remind patients and accompanying persons to:
  - comply with respiratory hygiene and cough etiquette
  - report to staff if they have respiratory symptoms or infection

**Resources**

- Provide adequate resources for performing hand hygiene and cough etiquette signage in or near waiting areas
- Provide lidded waste receptacles for disposal of used mask and tissue papers
- Provide readily accessible ABHR or hand washing facilities (i.e. liquid soap, disposable towels or hand dryer) where sinks are available. Ensure the facilities for hand disinfection and hand washing are consistently available and function well

**Spatial separation**

- Instruct persons with respiratory symptoms to put on surgical masks and sit away from others (ideally > 3 feet or 1 meter) in a designated waiting area

#### 5.4. Patient triage

Early identification and early isolation is one of the key strategies to prevent the spread of infectious diseases in clinic settings. A high index of suspicion is needed for identifying potentially infectious individuals.

- i. Provide adequate training and information to the reception staff on triaging. Keep updated with latest situation of epidemic and information released by the CHP. Specific triage policies should be in place, such as the following:
  - a) To place visual alert at the conspicuous positions (e.g. at the entrance) of the clinic to remind patients to inform staff for symptoms of infection, such as fever, respiratory symptoms or rashes.
  - b) To collect triaging information, such as fever, travel history, contact history and symptoms of communicable diseases at the time of booking appointment or registration.
- ii. Inform clinic in-charge immediately if suspected cases are identified. During patient triage, the following should be observed:
  - a) Frontline staff should assess patients for conditions that require additional precautions (i.e. transmission-based precautions) and prioritize those who may require urgent consultation and isolation.

- b) Patients with high suspicion of infectious risk should be accommodated in designated area away from other patients to minimize cross infection.
- c) Compliance of respiratory hygiene and cough etiquette should be ensured.
- d) To provide surgical mask to patients identified with respiratory symptoms.
- e) To minimize the time of stay for patients with suspected symptoms by facilitating early consultation and departure.

## **5.5. Safe injection practices and sharps handling**

5.5.1 The clinic staff should adhere to basic aseptic technique for the preparation and administration of parenteral medications.

5.5.2 Sharps injury, especially involving disposable needles, are well-known risks in all healthcare settings. Safe handling, use and disposal of sharps are necessary to prevent injury and the possible transmission of bloodborne diseases, including hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV).

5.5.3 The general principles of prevention of sharps injury are listed in the box below. (Please refer to the CHP guidelines “Prevention of Sharps Injury and Mucocutaneous Exposure to Blood and Body Fluids”<sup>1</sup> at: [http://www.chp.gov.hk/files/pdf/prevention\\_of\\_sharps\\_injury\\_and\\_mucocutaneous\\_exposure\\_to\\_blood\\_and\\_body\\_fluids.pdf](http://www.chp.gov.hk/files/pdf/prevention_of_sharps_injury_and_mucocutaneous_exposure_to_blood_and_body_fluids.pdf) for details)

- Use of a sterile, single-use, disposable needle and syringe for each injection. If a reusable dental syringe is used, it must be sterilized and assembled with sterile, single-use, disposable needle and cartridge for each use in a patient
- Implement sharps injury preventive measures, such as the use of sharps disposal containers, and needles and other devices with sharps injury prevention feature

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<sup>1</sup> Centre for Health Protection. Prevention of Sharps Injury and Mucocutaneous Exposure to Blood and Body Fluids. 2009.



- Contaminated needles and other contaminated sharps should not be bent, recapped, manipulated or removed unless such action is required by a specific procedure
- If recapping of needles is inevitable, use recapping devices or one-handed scoop technique. Used needles and sharps shall be discarded into sharps box
- The sharps box is recommended to be placed in a convenient place near to where the sharps are used
- Do not overfill the sharps box. Dispose the sharps box when it reaches the warning line (70-80%) for maximum volume
- Secure the sharps box in an upright position or place in the rack for sharps box
- Seal up the sharps box and place into a heavy duty red plastic bag with international biohazard sign for proper disposal (Please refer to the Code of Practice for the Management of Clinical Waste – Small Clinical Waste Producers at [http://www.epd.gov.hk/epd/clinicalwaste/file/doc07\\_en.pdf](http://www.epd.gov.hk/epd/clinicalwaste/file/doc07_en.pdf) for details)

5.5.4 Postexposure management involves provision of first aid, reporting, risk assessment and counselling. It is important that healthcare facilities should have a protocol in place. Please refer to the CHP guideline “Recommendations on the Management and Postexposure Prophylaxis of Needlestick Injury or Mucosal Contact to HBV, HCV and HIV”<sup>2</sup> at [http://www.chp.gov.hk/files/pdf/recommendations\\_on\\_postexposure\\_management\\_and\\_prophylaxis\\_of\\_needlestick\\_injury\\_or\\_mucosal\\_contact\\_to\\_hbv\\_hcv\\_and\\_hiv\\_en\\_r.pdf](http://www.chp.gov.hk/files/pdf/recommendations_on_postexposure_management_and_prophylaxis_of_needlestick_injury_or_mucosal_contact_to_hbv_hcv_and_hiv_en_r.pdf)

## 5.6. Environmental cleaning and disinfection

5.6.1 Pathogens may spread from an inanimate environmental reservoir to the patient. Cleaning and disinfection are important to achieve a basic level of infection prevention and control. Environmental cleaning is the physical removal of soiled substances or organic matters, e.g. blood and body

<sup>2</sup> Centre for Health Protection. Recommendations on the Management and Postexposure Prophylaxis of Needlestick Injury or Mucosal Contact to HBV, HCV and HIV. 2014.

substances, which is achieved with the use of water, environmental detergent and mechanical action. Environmental cleaning is also a prerequisite for disinfection. If the surface is not properly cleaned, the soiled substances or organic matters that remain on the surface will interfere the effectiveness of disinfection.

- i. Clinics should have in place a cleaning and disinfection policy that includes:
  - a) routine, scheduled cleaning and disinfection regimens, and;
  - b) spillage of blood and body substances.
- ii. It is important that all environmental surfaces within clinics are covered in the cleaning schedule.

5.6.2 The following should be observed for scheduled cleaning and disinfection of environmental surfaces:

- i. Schedule of cleaning, operational manual and training of staff should be established according to the risk assessment. High touch areas (HTA) are those environmental spots with frequent hand contacts, e.g. door handles and reception desk. More attention should be paid to HTA during cleaning and disinfection of environmental surfaces to prevent cross transmission of pathogens.
- ii. To ensure an adequate supply of appropriate cleaning equipment.
- iii. To prepare fresh disinfectant solution according to manufacturer's instructions.
- iv. To work from clean to dirty and from high to low areas of the room / area.
- v. Damp mopping to avoid creation of aerosols or splashing, or dust dispersion.
- vi. All reusable cleaning equipment (e.g. cloth, towel, mop and bucket) should be decontaminated with detergent and water / appropriate disinfectant. Store all equipment in a well-ventilated environment that prevents the retention of moisture and facilitates drying.
- vii. To clean and disinfect the room used by patients with symptoms suggestive of infectious diseases after patient is discharged.
- viii. To monitor the performance of cleaning to ensure the environment has been cleaned appropriately.

<b>Examples of environmental cleaning and disinfection practices</b>
<p><b>Furniture, other fixtures and fittings</b></p> <ul style="list-style-type: none"> <li>• Clean and disinfect the furniture, fixtures and fitting regularly or when it is visibly soiled</li> </ul>
<p><b>Examination tables and couch</b></p> <ul style="list-style-type: none"> <li>• Clean and disinfect the uncovered examination tables and couch between patients at least daily or when it is visibly soiled or contaminated</li> </ul>
<p><b>Computers</b></p> <ul style="list-style-type: none"> <li>• Cover the keyboard of computers in the examination or consultation rooms to facilitate cleaning and disinfection.</li> <li>• Include the keyboard and mouse in the routine cleaning protocol</li> </ul>
<p><b>Magazines / Books</b></p> <ul style="list-style-type: none"> <li>• Replace shared magazines, books in the waiting room regularly or when it is visibly soiled or contaminated</li> </ul>
<p><b>Toys</b></p> <ul style="list-style-type: none"> <li>• Toys, if available, should be made of nonporous material and easily disassembled for cleaning and disinfection</li> <li>• Replace any toys that are damaged, cracked or broken</li> <li>• Clean the toys regularly and as required</li> </ul>
<p><b>Floor</b></p> <ul style="list-style-type: none"> <li>• Clean the floor with detergent and water daily or more frequently in view of the need in the facilities</li> <li>• Cleaning should start at the relatively clean areas and proceed to the dirty areas (including the toilets, which should be the last)</li> </ul>

5.6.3 The following should be observed when handling spills of blood and body substances:

- i. Spills of blood and body fluids must be cleaned and disinfected promptly.
- ii. Alert signage should be placed at the nearby areas to alert others there is spill of blood or body fluids on the floor.
- iii. Appropriate PPE should be worn when handling the spills of blood and body fluid or when splashing is anticipated.
- iv. Strong absorbent disposable paper towels should be used to wipe away the blood, secretions, vomitus or excreta.
- v. The used absorbent disposable paper towels should be placed into a waste bag carefully without contaminating oneself or the environment or the outer surface of the bag.
- vi. Appropriate disinfectant should be used to disinfect the surface and the

neighboring area.

- vii. All contaminated waste materials should be discarded into appropriate plastic waste bag.
- viii. Hand hygiene should be performed after the procedure.

**Example of disinfection:**

- If places are contaminated by secretions, vomitus or excreta, use 1 part of household bleach containing 5.25% sodium hypochlorite to 49 parts of water, leave for 15-30 minutes, rinse with water and wipe dry afterwards
- If places are contaminated by blood, use 1 part of household bleach containing 5.25% sodium hypochlorite to 4 parts of water, leave for 10 minutes, rinse with water and wipe dry afterwards
- Floor mop or other cleaning utensils should be treated properly after each use. Disinfect such utensils by immersing in 1 part of household bleach containing 5.25% sodium hypochlorite to 49 parts of water for 30 minutes, then wash with detergents and water. Re-use after drying out

## **5.7. Reprocessing of reusable medical devices**

5.7.1 Decontamination of reusable medical devices is necessary to prevent transmission of organisms between patients. Disinfection is used to eliminate many or all pathogenic microorganisms, except bacterial spores, on inanimate objects. Sterilization is used to destroy or eliminate all forms of microbial life. Reusable medical devices must not be used in another patient before it has been properly cleaned and reprocessed. It is also important to note that single use medical devices should not be reused or reprocessed.

5.7.2 Before disinfection or sterilization, thorough cleaning is essential because inorganic and organic materials that remain on the surfaces of medical devices would interfere the effectiveness of these processes.

**Important Notes**

- Standard procedures for containing, transporting, and handling medical devices that may be contaminated with blood or body fluids should be established

- The management should assign responsibilities for reprocessing of medical devices to competent staff with appropriate training
- Manufacturer's instructions for reprocessing of any reusable medical devices in the facility (including point-of-care devices such as blood glucose meters) should be readily available and followed during the reprocessing

### 5.7.3 Cleaning (manual / automated cleaning)

- i. Cleaning is the removal of visible soil (e.g. organic and inorganic material) from objects and surfaces, and normally is accomplished manually or automatically using water with detergents or enzymatic products. It is an essential and important step before proceeding to disinfection or sterilization.
- ii. Medical devices should be rinsed gently under running water; or soaked in a solution of lukewarm water (not more than 45°C) or any presoaking solutions (e.g. enzymatic, disinfectants, or detergents, in accordance with the instructions from device manufacturers) to prevent coagulation of proteinaceous substances, and remove gross soil.
- iii. Standard precautions should be applied when handling used medical devices.
- iv. Appropriate PPE should be worn when cleaning the used medical devices to minimize occupational exposure. Care should be taken not to produce splashes.
- v. Automated cleaning (e.g. use of automatic washer-disinfector, ultrasonic cleaner) may improve cleaning effectiveness and reduce the risk of exposure to blood and body fluid.

### 5.7.4 Disinfection and sterilization methods

Medical devices can be classified into the following three categories according to Spaulding's Classification based on risk of infection involved with their use. The classification is used to determine the degree of disinfection or sterilization required for various medical devices.

- i. **Critical items** confer a high risk for infection if they are contaminated

with any microorganisms. Objects that enter sterile body areas or the vascular system must be sterile because any microbial contamination could transmit disease.

- ii. **Semi-critical items** are devices that come into contact with mucous membranes or non-intact skin, which require, at a minimum, high-level disinfection. These medical devices should be free from all microorganisms; however, small number of bacterial spores is permissible. Cleaning followed by high-level disinfection should eliminate enough pathogens to prevent transmission of infection.
- iii. **Non-critical items** are those that come into contact with intact skin. Intact skin acts as an effective barrier to most microorganisms; therefore the sterility of items coming in contact with intact skin is not critical. Low-level disinfection is generally sufficient.

The relevant recommended methods for disinfection and sterilization according to Spaulding's Classification are detailed at [Appendix 5a](#) and a list of commonly used disinfectants is at [Appendix 5b](#) for reference.

#### 5.7.5 Sterilization

##### **Bench-top steam sterilizers (Autoclaves)**

Critical items which are not heat sensitive can be sterilized reliably by steam under pressure using steam sterilizers. The following have to be observed when using sterilizers:

- i. Sterilizers should be located in treatment room / specific room away from traffic and they should not discharge steam / vapor into waiting area.
- ii. Sterilizers must be operated only by staff who has been adequately instructed in their use. The operating persons should record the details of each load and the mechanical indicators as listed below in a log book specifically kept for this purpose.
- iii. At constant temperatures, sterilization times vary depending on the type of item (e.g. metal versus rubber, plastic, items with lumens), whether the item is wrapped or unwrapped, and the sterilizer type. The exposure times can also vary according to the design of the particular sterilizer.
- iv. The manufacturer operation manual should be referred for specific

exposure times, temperatures, and drying times of sterilization cycles. In general, the common temperature and time parameters for various types of loads as recommended by Centers for Disease Control and Prevention (CDC)<sup>3</sup> and Association for the Advancement of Medical Instrumentation (AAMI)<sup>4</sup> are as follows:

Type of sterilizer	Item	Exposure time at 132°C	Drying time
Gravity displacement (Type N sterilizer)	Unwrapped nonporous instrument	3 min	0-1 min
Dynamic-air-removal e.g., prevacuum (Type B / S sterilizer)	Wrapped instruments	4 min	20-30 min

**Remarks:**

**Cycle time:** Total elapsed time of a sterilization cycle from the time the process is initiated until the cycle is completed. It can include come-up time, exposure time, come-down time, cooling or drying time, and, in prevacuum sterilizers, pre- and post-vacuum time.

**Exposure time:** Period for which the process parameters are maintained within their specified tolerances. In a steam sterilization process, exposure time is the period during which items are exposed to saturated steam at the specified temperature.

**Drying time:** Time required to dry steam-sterilized items before they are handled. As used in relation to gravity-displacement table-top steam sterilizers and sterilizers without active drying, drying time refers to the time that the sterilizer door is left open to complete the drying of sterilized items.

- v. A standard operation chart for the correct exposure periods of all supplies should be prepared and posted for easy daily reference.
- vi. The effectiveness of a sterilization process should be monitored regularly, with reference to the manufacturers' recommendations and / or acceptable international standards on steam sterilization (e.g. The Guideline for Disinfection and Sterilization in Healthcare Facilities by

<sup>3</sup> Centers for Disease Control and Prevention, United States. Guideline for Disinfection and Sterilization in Healthcare Facilities. 2008.

<sup>4</sup> Association for the Advancement of Medical Instrumentation, United States. Comprehensive guide to steam sterilization and sterility assurance in health care facilities. AAMI ST79:2013.

CDC; Health Technical Memorandum 01-05 – Decontamination in primary care dental practices by UK). All the results should be documented and recorded.

vii. There are two options to evaluate the effectiveness of steam sterilization process:

a) Routine monitoring: The sterilization process monitoring requires the use of mechanical indicators, external and internal chemical indicators, and biological indicators to provide a comprehensive picture to ensure the process has been effective<sup>3</sup>. For example, the Guideline for Disinfection and Sterilization in Healthcare Facilities by CDC is one of the standards that adopt the approach of routine monitoring to monitor the sterilization process. The application of routine monitoring in benchtop sterilizers according to CDC comprises the following components:

- Mechanical indicators record cycle time, temperature, and pressure as displayed on the sterilizer gauges for each instrument load; and
- External chemical indicators such as autoclave tape are affixed on the outside of each instrument pack to show that the package has been processed through a sterilization cycle. An internal chemical indicator should be placed inside the packs to verify sterilant penetration; and
- Biological indicators should be tested at least weekly with spore vials placed at the area least favorable to sterilization (i.e., the area representing the greatest challenge to the biological indicator). This area is normally in the front, bottom section of the sterilizer, near the drain. The results of spore test should be recorded.
- When dynamic air removal sterilizer is used,
  - Appropriate steam penetration test such as Bowie-Dick test or Helix test should be performed before the first processed load of the day.



b) Parametric release: It is a declaration that product is sterile, based on records demonstrating that the process parameters were delivered within specified tolerances<sup>5</sup>. Parametric release requires a well-defined quality system in place at the healthcare facilities performing sterilization and the sterilization process be validated. For example, Health Technical Memorandum (HTM) 01-05 – Decontamination in Primary Care Dental Practice is one of the standards that adopt the approach of parametric release to monitor the sterilization process<sup>6</sup>. The application of parametric release in benchtop sterilizers according to HTM 01-05 comprises the following components:

- Benchtop sterilizer being installed, commissioned, validated and maintained appropriately according to manufacturer’s instruction; and
- Validation of instrumentation for parametric release being functional and appropriately calibrated, through on-going routine periodic tests and maintenance tasks; and
- Demonstration of suitable physical conditions (temperature, pressure, time) for sterilization.

viii. In case of unsatisfactory test results, manufacturer should be consulted for maintenance or replacement. The CDC recommendations<sup>3</sup> on the unsatisfactory test results are as follows:

- a) Do not use processed items if the mechanical (e.g., time, temperature, pressure) or chemical (internal and/or external) indicators suggest inadequate processing.
- b) If the mechanical (e.g., time, temperature, pressure in the steam sterilizer) and chemical (internal and / or external) indicators suggest that the sterilizer was functioning properly, a single positive spore test probably does not indicate

<sup>5</sup> International Organization for Standardization. Sterilization of healthcare products – vocabulary. ISO/TS 11139:2006.

<sup>6</sup> Department of Health, United Kingdom. Health Technical Memorandum 01-05: Decontamination in primary care dental practices. 2013.

sterilizer malfunction but the spore test should be repeated immediately. If the spore tests remain positive, use of the sterilizer should be discontinued until it is serviced.

- ix. Sterilizer should be serviced regularly at yearly intervals and as necessary.
- x. After new installation, relocation, sterilization failure and major repairs, steam sterilizer should be tested according to the manufacturer instruction before service. In general, CDC<sup>3</sup> recommends that three consecutive empty cycles with indicators should be run, one right after the other. For dynamic air removal sterilizers, appropriate steam penetration test (e.g. Bowie-Dick test pack or Helix test) should also be run with each test demonstrating sufficient air removal. The sterilizer should not be put back into use until all biological indicators are negative and chemical indicators show correct end-point responses.
- xi. Some more points to note:
  - a) Traditional bench-top steam sterilizers (gravity displacement) without vacuum extraction cycle are primarily used to process nonporous articles whose surfaces have direct steam contact. Unwrapped critical medical devices must be used at point-of-care after autoclaving. Semi-critical items for dental procedures which do not require wrapping may also undergo autoclaving (Please refer to session 6.3 for requirements specific for dental clinics).
  - b) Type of water to be filled and the schedule of changing / refill in the water tank of the sterilizer should follow the recommendations by product manufacturer.

### 5.7.6 Sterile storage

- i. Sterile supplies should be stored in an environment with suitable temperature and humidity which is free from dust, insects and vermin.
- ii. Storage of disposable items should be in accordance with the instructions of the device manufacturers.
- iii. The reprocessed reusable sterile medical devices should be preferably stored in temperature less than 24°C with relative humidity kept below 70%.
- iv. Sterilized items are recommended being stored in the enclosed cabinets / drawers, well separated from other non-sterilized items and away from potential source of contamination and with limited access.
- v. Outside shipping containers and corrugated cartons should not be used as storage containers.
- vi. Open shelving may be used, but requires special attention to traffic control, area ventilation, and housekeeping to prevent the contamination of the devices.
- vii. Packaging should not be crushed, bent, folded, compressed, or punctured.
- viii. Storage surfaces should be non-porous, smooth and easily cleaned.
- ix. A label indicating the expiry date of the sterilized packages and other information, such as the package contents, identification of the sterilizer and cycle number, initials of the staff who prepared the package and date sterilized, should be affixed on every item.
- x. All packages containing sterile items should be inspected before use to verify barrier integrity and dryness. Any package that is wet, torn, damaged or beyond the expiry date should not be used. The instruments should be reprocessed, packaged in new wrap, and sterilized again. If it is single use item, it should be discarded.
- xi. Where an event-based storage system is adopted, a quality assurance system should be implemented taking into account of the quality of the packaging material, the storage condition, condition during transport, and the amount of handling.
- xii. An effective stock management system should be maintained, e.g. stock should be used according to the principle “first in, first out” so that sterile items are used before expired.

### 5.7.7 Chemical disinfection

Chemical disinfection could be an alternative for heat labile semi-critical and non-critical items. However, there are many drawbacks such as materials compatibility, variability in the bactericidal effect, inactivation and different exposure times of respective disinfectants (refer to [Appendix 5b](#) for properties of various chemical disinfectants).

**When using chemical disinfection, the following should be observed:**

- The containers used for disinfection should be kept covered during use to avoid contamination and occupational hazard such as release of irritant chemical vapor
- Do not top up the prepared solution with fresh solution
- The container should be washed, rinsed and dried when the solution is changed
- The containers should be clearly labelled with contents, recommended concentration for soaking and exposure time required and expiry date
- Manufacturer's instructions, which include contact time, concentration / dilution, water requirement and rinsing method of the selected disinfectant, should be followed
- Different disinfectants should not be mixed or used in combination
- Appropriate disinfectants in accordance with the recommended practice should be used
- Health and safety precautions, such as adequate ventilation to evacuate the released chemical vapor and use of appropriate PPE, should be followed

### 5.7.8 Education and training

Staff responsible for the decontamination process should have demonstrated knowledge of the processes and infection control principles. They should supervise and arrange related training to any persons involved in cleaning, disinfection and sterilization process.

## 5.8. Waste management

Clinical waste, domestic waste and chemical waste should be segregated at the sources of production. Lidded waste receptacles, preferably with foot-pedal, should be used in clinical areas. Waste bags for clinical waste should be securely fastened when reaching the warning line for maximum volume (70-80% full). Domestic waste should be disposed of daily. Relevant statutory requirements on management of clinical waste and chemical waste (e.g. Waste disposal (Chemical Waste) (General) Regulation, Waste Disposal (Clinical waste) (General) Regulation) should be observed. Relevant codes and guidelines are published by the Environmental Protection Department (EPD), such as the following:

- i. “Code of Practice for the Management of Clinical Waste – Small Clinical Waste Producers”<sup>7</sup>:  
[http://www.epd.gov.hk/epd/clinicalwaste/file/doc06\\_en.pdf](http://www.epd.gov.hk/epd/clinicalwaste/file/doc06_en.pdf)
- ii. “A Guide to the Chemical Waste Control Scheme”<sup>8</sup> :  
[http://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentalnhk/waste/guide\\_ref/files/guide\\_e.pdf](http://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentalnhk/waste/guide_ref/files/guide_e.pdf)
- iii. “Code of Practice on the Packaging, Labelling and Storage of Chemical Waste”<sup>9</sup>:  
[http://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentalnhk/waste/guide\\_ref/files/chemw\\_e.pdf](http://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentalnhk/waste/guide_ref/files/chemw_e.pdf)

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<sup>7</sup> Environmental Protection Department, Hong Kong. Code of Practice for the Management of Clinical Waste – Small Clinical Waste Producers. 2010.

<sup>8</sup> Environmental Protection Department, Hong Kong. A Guide to the Chemical Waste Control Scheme. 2016.

<sup>9</sup> Environmental Protection Department, Hong Kong. Code of Practice on the Packaging, Labelling and Storage of Chemical Waste. 1992.

## **5.9. Handling of linen**

A policy on the management of linen should be in place wherever applicable. Clean linen should be handled, transported and stored separately from used linen. Principles of handling used linen are as follows:

- i. Soiled textiles, including bedding, towel and working clothes may be contaminated with pathogenic microorganisms. Standard precautions should be applied when handling used linen.
- ii. Appropriate PPE should be worn during handling of soiled linen.
- iii. All used linen should be handled as little as possible and with minimal agitation to avoid contamination of environment and persons.
- iv. Sorting or pre-rinsing of used linen in patient care areas is not recommended.
- v. All used linen should be contained in a laundry bag or designated bin.
- vi. Soiled or contaminated linen should be placed in leak resistance bag with proper label.

## **5.10. Collection and handling of specimen**

- 5.10.1 Adherence to standard precautions and hand hygiene is crucial during specimen collection. Transmission-based precautions may be required according to patients' conditions.
- 5.10.2 Specimens should be taken correctly and placed in a leak-proof specimen container. The cap should be securely closed.
- 5.10.3 The outside of specimen containers should not be contaminated.
- 5.10.4 Specimen trays should be thoroughly cleaned and disinfected periodically (i.e. at least daily or when contaminated).
- 5.10.5 Refrigerator(s) used for specimen storage should be clearly labelled and should not be used for food, drinks or medications.
- 5.10.6 Specimens should be kept upright as far as possible to prevent leakage during transport to the laboratory.
- 5.10.7 Specimens should be transported in individual leak-proof bags marked with "BIOHAZARD". Request forms should be placed outside the plastic bag.
- 5.10.8 Hand hygiene should be performed after handling any specimen.
- 5.10.9 Specimen courier should be instructed on how to handle spillage.
- 5.10.10 Spillage kit should be available during transportation as necessary.

## 6. Others

### 6.1. Infection control related issues on medications

6.1.1 The principles of use and storage of medications, and refrigerator for vaccines should refer to Good Dispensing Practice Manual<sup>10</sup> (<http://www.hkma.org/chinese/downloadarea/index.htm>) and Hong Kong Reference Framework for Preventive Care for Children in Primary Care Settings - Module on Immunisation<sup>11</sup> [http://www.pco.gov.hk/english/resource/files/Module\\_on\\_Immunisation\\_Children.pdf](http://www.pco.gov.hk/english/resource/files/Module_on_Immunisation_Children.pdf).

6.1.2 The use of multidose vials is not recommended. It would increase the risk of transmitting bloodborne pathogens and bacterial contamination. If multidose vials are used, it must be used scrupulously with the following recommendations:

- i. The product leaflet for recommended duration of use after first entry of the multidose vial should be reviewed.
- ii. The date on which the multidose vial was first used should be marked to ensure discarding at appropriate time.
- iii. Strict aseptic technique should be adhered when accessing multidose vials.
- iv. The multidose vials must not be re-entered with a used needle or syringe.
- v. If contamination is suspected, the multidose vial must be discarded immediately.

### 6.2. Operating rooms in day procedure centres

“Day procedure centre” refers a clinic where high-risk medical procedures, as defined in the Core Standards for Day Procedure Centres<sup>12</sup> promulgated by the Hong Kong Academy of Medicine and the Department of Health, [http://www.dh.gov.hk/english/main/main\\_orphf/files/CS\\_DPC.pdf](http://www.dh.gov.hk/english/main/main_orphf/files/CS_DPC.pdf), are performed. A day procedure centre may equip an operating room (OR) or

<sup>10</sup> Hong Kong Medical Association. Good Dispensing Practice Manual. 2016.

<sup>11</sup> Department of Health. Hong Kong Reference Framework for Preventive Care for Children in Primary Care Settings - Module on Immunisation. 2017.

<sup>12</sup> Hong Kong Academy of Medicine and Department of Health. Core Standards for Day Procedure Centres. 2017.

a procedure room for conducting invasive procedures. Higher level of cleanliness or sterility would be required for these settings. Please refer to [Appendix 6](#) for the specific requirements for setting up an operating room in a day procedure centre.

### **6.3. Requirements specific for dental clinics**

#### 6.3.1 Reprocessing of reusable devices

- i. Items not designed to be reused (e.g. saliva ejectors, scalpel blades, needles, local anaesthetic cartridges, sutures, matrix bands) must be disposed of after use.
- ii. All dental handpieces (including ultrasonic scalers), which are very difficult to be thoroughly disinfected, must be sterilized after use.
- iii. 3-in-1 syringe tips (disposable or sterilizable) must be changed between patients.
- iv. Heat stable semi-critical dental instruments (e.g. mirror and probes) should be sterilized after use. For instruments that are not heat stable, high level disinfection is the minimum level of reprocessing that is acceptable.

#### 6.3.2 Asepsis of Dental Unit Waterlines (DUWL)

- i. DUWL refer to the pipeline system that delivers water to handpieces, 3-in-1 syringe and ultrasonic scaler. Biofilm will develop in DUWL as in any other water systems. Microbial level in DUWL should be minimized.
- ii. Sterile irrigation solution must be used for all surgical procedures, such as dento-alveolar surgeries and implant placement.

#### 6.3.3 Reduction of aerosol and splatters generated during dental treatment

Measures such as high volume suction should be used to reduce aerosol and splatters generated during dental treatments.

#### 6.3.4 Surface Asepsis

All clinical contact surfaces (e.g. ultrasonic scaler handle, 3-in-1 syringe handle, light handle) should be barrier-protected or disinfected for each patient.



### 6.3.5 Laboratory items

Laboratory items (e.g. impressions, appliances) should be disinfected before sending to dental laboratories. If these items are not disinfected in the laboratories before returning to the dental clinics, they should be disinfected before putting them in the patients' mouths.

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## Appendix 1: Checklist for Infection Prevention and Control

### 1. Administrative

	Written infection control policy, organization structure and procedures are in place and promulgated to staff
	Staff are aware of the infection control policy, organization structure and procedures
	Staff understand their responsibility of infection control in their practice
	Staff are aware of the process of specimen handling and transport
	Staff are aware of their personal hygiene
	Staff sickness reporting and record system are in place
	Staff receive appropriate immunization

### 2. Facility

	Hand hygiene facilities are available and easily accessible to staff and patients
	Hand hygiene poster and signage are displayed near hand hygiene facilities
	Sterilized items are stored in the clean and dry environment with enclosed cabinets / drawers well separated from other non-sterilized items and are away from potential source of contamination and with limited access
	Manufacturer's instructions for reprocessing of any reusable medical equipment in the clinic are followed during the reprocessing
	Performance test of autoclave is monitored according to manufacturer instruction, and test record for each autoclave is available

### 3. Reception Area

	Infection control poster or signage about symptoms of communicable diseases is placed at reception
	Patient with symptoms of communicable diseases is given appropriate instruction and triage accordingly
	Reception staff wear appropriate PPE when caring patients with symptoms of infectious diseases
	Posters with visual alerts for respiratory hygiene / cough etiquette are displayed as appropriate

### 4. Examination / Treatment Room

	Hand washing sinks or alcohol-based hand rub is available
	Sharps are discarded appropriately
	Sharps box / containers are not overfilled beyond the warning line
	Policy on use of PPE and adequate stock of PPE are available

### **5. Operating Room (OR)**

	Separate traffic flows for sterile and contaminated materials
	Regular monitoring to achieve a temperature and relative humidity range of internationally acceptable standards
	The environment, fixtures and fittings of the OR are cleaned and disinfected thoroughly between cases by appropriate disinfectants

### **6. Environmental Cleaning**

	All environmental surfaces are cleaned and disinfected regularly according to the schedule
	There is a procedure for cleaning spills of blood and body substances
	Waste is segregated and managed according to local regulations
	Appropriate disinfectant is used for surfaces, equipment and instruments

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## Appendix 2a: Types of PPE and their Indications

Types of PPE	Indications	Remarks
Gloves	<p>Should be worn when there is an anticipated risk that hands would be contacted with</p> <ul style="list-style-type: none"> <li>- blood or body fluids, secretions, excretions, non-intact skin, mucous membrane and potentially infectious material;</li> <li>- patients who are colonized or infected with pathogens transmitted by contact route, e.g. VRE, MRSA;</li> <li>- handling or touching visibly or potentially contaminated patient care equipment and environmental surfaces.</li> </ul>	<ul style="list-style-type: none"> <li>• Wearing gloves is not a substitute for hand hygiene</li> <li>• Remove gloves after caring for a patient. Do not wear the same pair of gloves for caring different patients.</li> <li>• Change gloves between tasks and procedures on the same patient after contact with material that may contain a high concentration of microorganisms.</li> <li>• Remove gloves promptly after the procedure, before touching non-contaminated items and surface, e.g. handling telephones or performing office work.</li> <li>• Perform hand hygiene immediately after removal of gloves.</li> <li>• Selection of powder free gloves is recommended since this avoids interactions with the alcohol-based handrub and also the gritty feeling on hands.</li> <li>• Do not reuse disposable gloves.</li> <li>• Sterile gloves should be used for surgical/aseptic procedures.</li> <li>• Appropriate gloves sizes and types should be readily available.</li> </ul>
Aprons and Gowns	<p>Should be worn when there is a risk of contamination of skin and clothing during procedures or activities that are likely to generate splashes or sprays of blood, body fluids, excretions and secretions.</p>	<ul style="list-style-type: none"> <li>• Single-use plastic aprons are suitable for general use when there is a low risk that clothing may be exposed.</li> <li>• If it is anticipated that there will be heavy exposure, gowns should be worn.</li> </ul>
Facial protection:	Use of mouth, nose and eye protection reduces the risk of exposure during procedures that are likely to generate splashes or sprays of blood or other body fluids.	
a) Surgical Masks	<p>Should be worn by staff</p> <ul style="list-style-type: none"> <li>- to protect themselves from contact with infectious material from patients, e.g. respiratory secretions and sprays of blood or body fluids;</li> <li>- when engaged in procedures requiring sterile technique to protect patients from exposure to infectious agents carried in a HCW's mouth or nose.</li> <li>- working within 3 feet (1 meter) of patients on droplet precautions.</li> </ul>	<ul style="list-style-type: none"> <li>• Placed on coughing patients to limit potential dissemination of infectious respiratory secretions from the patient to others (i.e., Respiratory Hygiene and Cough Etiquette)</li> </ul>
b) N95 or equivalent respirators	<p>Should be worn by staff</p> <ul style="list-style-type: none"> <li>- for potential exposure to infectious agents transmitted via airborne route.</li> <li>- performing aerosol generating procedures e.g. nasopharyngeal aspiration, endotracheal intubation.</li> </ul>	<ul style="list-style-type: none"> <li>• Staff should have fit test to ensure appropriate respirator selection and use.</li> <li>• Education on respirator use, especially on how to don and doff the specific brand and model of respirator that staff is using.</li> <li>• A seal check (formerly called a fit check) should be performed by the staff upon each application when a respirator is donned to check no air leak around the mask.</li> </ul>
c) Goggles and Face Shields	<ul style="list-style-type: none"> <li>- Should be worn by staff to protect the mucous membrane of the eye, nose and mouth during procedure that may generate splashes or sprays of blood, body fluids, excretions and secretions.</li> </ul>	<ul style="list-style-type: none"> <li>• Personal eyeglasses and contact lenses are not acceptable as they do not provide sufficient eye protection.</li> </ul>



## Appendix 2b: Summary of Recommended PPE Usage in Standard Precautions and Transmission-Based Precautions

PPE		N95 Respirator	Surgical Mask	Goggles/ Face Shield	Gown	Gloves
Precautions						
<b>Standard Precautions (SP)</b>			Splashing procedure	Splashing procedure	Splashing procedure	Touching blood, body fluid, secretion, excretion and contaminated items
<b>Transmission- Based Precautions</b>	<b>Airborne Precautions</b>	<ul style="list-style-type: none"> <li>• Patient care</li> <li>• When performing aerosol generating procedures</li> </ul>	Place on the patient if transport is necessary			
	<b>Droplet Precautions</b>		<ul style="list-style-type: none"> <li>• Within one meter of patient</li> <li>• Place on the patient if transport is necessary</li> </ul>			
	<b>Contact Precautions</b>				Substantial contact	Touching infected patient, materials or contaminated items

### Appendix 3: WHO “My 5 moments for Hand Hygiene”

<b>Moment</b>	<b>When</b>	<b>Why</b>	<b>Reference examples</b>
<b>Moment 1.</b> <b>Before touching a patient</b>	Clean your hands before touching a patient.	To protect the patient against harmful germs carried on your hands.	Before taking pulse, blood pressure, chest auscultation, physical examination, applies skin antiseptic to injection site.
<b>Moment 2.</b> <b>Before clean/aseptic procedure</b>	Clean your hands immediately before performing a clean/aseptic procedure.	To protect the patient against harmful germs, including the patient’s own, from entering his/her body.	Before giving eye drops, secretion aspiration, wound dressing, injection, vaccination, catheter insertion, preparation of medication.
<b>Moment 3.</b> <b>After body fluid exposure risk</b>	Clean your hands immediately after a procedure involving exposure risk to body fluids (and after glove removal).	To protect yourself and the health-care environment from harmful patient germs.	After contact with body fluids or excretions, mucous membranes and non-intact skin, e.g. giving eye drops, secretion aspiration, wound dressing, specimen collection, clearing up urines, faeces, vomit, handling waste, cleaning of contaminated and visibly soiled instruments or areas.  Moving from a contaminated body site to another body site during care of the same patient
<b>Moment 4.</b> <b>After touching a patient</b>	Clean your hands after touching the patient at the end of the encounter or when the encounter is interrupted.	To protect yourself and the health-care environment from harmful patient germs.	After taking pulse, blood pressure, chest auscultation, physical examination.
<b>Moment 5.</b> <b>After touching patient surroundings</b>	Clean your hands after touching any object or furniture in the patient surroundings, when a specific zone is temporarily and exclusively dedicated to a patient-even if the patient has not been touched.	To protect yourself and the health-care environment from harmful patient germs.	After changing bed linen, perfusion speed adjustment, handling of oxygen tubing, holding a wheelchair/stretchers.  After cleaning the trolley, couch and removes gloves.

## Appendix 4: Hand Hygiene Technique



## Appendix 5a: Disinfection and Sterilization Methods according to Spaulding's Classification

Classification	Examples of Instrument	Level of Processing/Reprocessing	Methods (examples)
<p><b>Critical Item</b></p> <p>Enter sterile body cavity or vascular system</p>	<ul style="list-style-type: none"> <li>• Surgical instruments</li> <li>• Biopsy instruments</li> <li>• Implants</li> </ul>	<p><b>Cleaning</b> followed by:</p> <p><b>Sterilization</b></p> <p><i>Sterilization is a process that completely eliminates or kills all microorganisms &amp; spores</i></p>	<p><b>Sterilization</b></p> <ul style="list-style-type: none"> <li>• Steam Sterilization</li> <li>• Hydrogen peroxide gas plasma</li> <li>• &gt;2.4% glutaraldehyde-based formulations,</li> <li>• 0.95% glutaraldehyde with 1.64% phenol/phenate,</li> <li>• 7.5% stabilized hydrogen peroxide,</li> <li>• 7.35% hydrogen peroxide with 0.23% peracetic acid,</li> <li>• 0.2% peracetic acid, and</li> <li>• 0.08% peracetic acid with 1.0% hydrogen peroxide</li> </ul>
<p><b>Semi-critical Item</b></p> <p>Contact mucous membranes, or non-intact skin but do not penetrate them</p>	<ul style="list-style-type: none"> <li>• Respiratory therapy equipment</li> <li>• Anaesthesia equipment</li> <li>• Tonometer</li> <li>• Ultrasound endocavity probes: transvaginal/ transrectal</li> <li>• Cryosurgical probes</li> <li>• Endoscopes,</li> <li>• Laryngoscope blades</li> <li>• Proctoscope</li> <li>• Vaginal speculum</li> </ul>	<p><b>Cleaning</b> followed by:</p> <p><b>High-Level Disinfection</b></p> <p><i>High level disinfection eliminates all microorganisms, except for small number of bacterial spores</i></p> <p>(Steam sterilization is preferred if the items are heat stable.)</p>	<p><b>High-Level Disinfection</b></p> <ul style="list-style-type: none"> <li>• Glutaraldehyde</li> <li>• Hydrogen peroxide solution</li> <li>• <i>Ortho</i>-pathalaldehyde (OPA)</li> <li>• Washer-disinfector that has a high-level disinfection cycle</li> </ul>
<p><b>Noncritical Item</b></p> <p>Contact intact skin</p>	<ul style="list-style-type: none"> <li>• ECG machines</li> <li>• Oximeters</li> <li>• Bedpans, urinals, commodes</li> <li>• Blood pressure cuffs</li> <li>• Stethoscopes</li> </ul>	<p><b>Cleaning</b> followed by:</p> <p><b>Low-Level Disinfection</b> (in some cases, cleaning alone is acceptable)</p> <p><i>Low level disinfection kills most bacteria, some fungi, and inactivates some viruses but it cannot be relied on to kill resistant microorganisms</i></p>	<p><b>Intermediate and Low-Level disinfection</b></p> <ul style="list-style-type: none"> <li>• Alcohol</li> <li>• Diluted sodium hypochlorite solution</li> <li>• Hydrogen peroxide</li> <li>• Washer-disinfector</li> </ul>

## Appendix 5b: Properties of Commonly Used Chemical Disinfectants

	Usual concentration	Spectrum of activity	Other properties	Recommended uses
<b>Hypochlorites</b> e.g. Clorox (5.25% available chlorine)	<ul style="list-style-type: none"> <li>• 1% (one part of 5.25% hypochlorite solution in 4 parts of water)</li> <li>• 0.1% (one part of 5.25% hypochlorite solution in 49 parts of water)</li> </ul>	<ul style="list-style-type: none"> <li>• Bacteria: Good</li> <li>• Tubercle bacilli: Good</li> <li>• Spores: Good</li> <li>• Fungi: Good</li> <li>• Viruses: Good</li> </ul>	<ul style="list-style-type: none"> <li>• Inactivated by organic matter</li> <li>• Corrosive to metals</li> <li>• Diluted solutions decay rapidly and should be made up daily</li> <li>• Addition of ammonia or acids causes release of toxic chlorine gas</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental or instrumental disinfection for selected items</li> </ul>
<b>Glutaraldehyde</b> e.g. Cidex	<ul style="list-style-type: none"> <li>• 2%</li> </ul>	<ul style="list-style-type: none"> <li>• Bacteria: Good</li> <li>• Tubercle bacilli: Good</li> <li>• Spores: Good but slow</li> <li>• Fungi: Good</li> <li>• Viruses: Good</li> </ul>	<ul style="list-style-type: none"> <li>• Slow penetration of organic matter</li> <li>• Irritate eyes, skin and respiratory mucosa</li> <li>• Alkaline solution requires activation and has a limited useful life (14 - 28 days)</li> </ul>	<ul style="list-style-type: none"> <li>• Disinfection of selected instruments which cannot be heat sterilized</li> <li>• Use only closed containers to reduce the escape of irritant vapors</li> </ul>
<b>Alcohol</b> e.g. Ethanol	<ul style="list-style-type: none"> <li>• 70%</li> </ul>	<ul style="list-style-type: none"> <li>• Bacteria: Good</li> <li>• Tubercle bacilli: Good</li> <li>• Spores: Poor</li> <li>• Fungi: Good</li> <li>• Viruses: Low activity against some viruses</li> </ul>	<ul style="list-style-type: none"> <li>• Rapid action but volatile</li> <li>• Poor penetration into organic matter</li> <li>• Inflammable</li> </ul>	<ul style="list-style-type: none"> <li>• Disinfection of physically clean surfaces and skin</li> </ul>
<b>Diguanides</b> e.g. Hibitane (Chlorhexidine) Savlon (Chlorhexidine Cetavlon)	<ul style="list-style-type: none"> <li>• Hibitane - Aqueous 1:1000</li> <li>• Hibitane - 0.5% in 70% Ethanol</li> <li>• Savlon - Aqueous 1:100, 1:30</li> <li>• Savlon - 1:30 in 70% Ethanol</li> </ul>	<ul style="list-style-type: none"> <li>• Bacteria: Good for Gram-positive organisms</li> <li>• Tubercle bacilli: Poor</li> <li>• Spores: Poor</li> <li>• Fungi: Good</li> <li>• Viruses: Poor</li> </ul>	<ul style="list-style-type: none"> <li>• Inactivated by organic matter, soap and anionic detergents</li> </ul>	<ul style="list-style-type: none"> <li>• Skin and mucous membrane disinfection</li> <li>• Opened bottle of aqueous skin disinfectant should be discarded after 24 hours</li> </ul>

## **Appendix 6: Specific Requirements for an Operating Room (OR) in a Day Procedure Centre**

This section should be read together with the Guidance Notes on Use of Operating Room for Surgical Procedures in Day Procedure Centres annexed in the Procedure-specific Standards for Day Procedure Centre (Surgery and Anaesthesia & Sedation) issued by the Department of Health (accessed via [http://www.dh.gov.hk/english/main/main\\_orphf/files/Procedure\\_Specific\\_Standards\\_for\\_Surgery\\_and\\_Anaesthesia.pdf](http://www.dh.gov.hk/english/main/main_orphf/files/Procedure_Specific_Standards_for_Surgery_and_Anaesthesia.pdf))

### **Definition of terms in this section:**

**Unrestricted area** – any area of a day procedures centre other than the semi-restricted and restricted areas as detailed below, such as waiting area.

**Semi-restricted area** – the area that separates a restricted area from unrestricted areas with specific signage, physical barriers, and / or security controls and protocols. This area can include peripheral supporting area for an operating room, such as scrub areas and corridors leading to restricted area, recovery area.

**Restricted area** – a designated space that can only be accessed through a semi-restricted area. The restricted access is primarily intended to support a high level of asepsis. Traffic in the restricted area is limited to authorized personnel and patients. Personnel in restricted areas are required to wear surgical attire and cover head and facial hair. Masks are required where open sterile supplies or scrubbed persons may be located.

## **I) Design and construction recommendations of the OR**

### **i. Location**

The OR should be located in the restricted area and physically separated from equipment reprocessing area and the dirty utility area.

### **ii. Ceilings, walls and floors**

- a) They should be made from non-porous and monolithic material, and capable to withstand cleaning and disinfection.
- b) Floor drains should not be installed.

### **iii. Scrub facilities**

- a) They should preferably be located in the semi-restricted area or in recessed area in the OR to prevent water contamination.
- b) Hand scrub area should be located next to the entrance to OR.
- c) If the scrub area or hand washing facility is located in the OR, in order to prevent water contamination, it is essential that the scrub area is located away from the area where laid-up instrument trolleys or aseptic field are located.
- d) If there is a door separating the scrub area and the OR, it should be a door with non-touch device to prevent scrubbed staff from re-contaminating their hands.
- e) Scrub sinks shall be equipped for hands-free operation (such as trimmed with foot, knee, or electronic sensor controls).

### **iv. Heating, Ventilation, and Air-Conditioning (HVAC)**

- a) Ventilation

- The ventilation system of OR should be designed and maintained in compliance with acceptable and prevailing international healthcare engineering standards<sup>1</sup>.
  - Supply air should be filtered according the acceptable and prevailing international healthcare engineering standards.
- b) Temperature and relative humidity
- The temperature and relative humidity of OR should be designed and maintained in compliance with acceptable and prevailing international healthcare engineering standards<sup>1</sup>.
  - Humidity indicator and thermometer should be installed at an easily observable location.
  - Temperature and humidity should be regularly monitored.
- v. Microbiological air sampling of OR
- a) Active microbiological air sampling should be performed as part of the commissioning process of new ORs.
  - b) Active microbiological air sampling should be performed following any major structural refurbishment (excluding routine HEPA filter changes) of an existing OR. A risk assessment should be undertaken for minor refurbishment projects to assess if dust migration can be controlled to consider if a microbiological air sampling is required.
  - c) Active microbiological air sampling should be a part of investigation of increased surgical site infections if evidence supports a link to the

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<sup>1</sup> Examples of acceptable international standards include HTM 03-01 (UK), ASHRAE Standard 170 (USA).



OR. Advice from a microbiologist should be sought prior to sampling.

- d) Where microbiological air sampling is indicated, the OR is not to be utilized until results of the air sampling have been confirmed.

## **II) Maintenance and Cleaning / Disinfection of the OR environment**

- i. Fixtures and fittings inside the OR should be kept to a minimum to reduce the risk of dust accumulation, and to allow easy cleaning.
- ii. The environment, fixtures and fittings of the OR should be cleaned and disinfected thoroughly between cases by appropriate disinfectants. It should also be cleaned and disinfected according to the established schedule.
- iii. A written protocol should be available for guiding the housekeeping personnel on the steps of cleaning and disinfecting the environment, fixtures and fittings in the OR.
- iv. The environment, fixtures and fittings of the OR should be inspected in accordance with the established schedule. The identified defects should be rectified as soon as possible.

## **III) Staff preparation for entrance to the OR**

- i. Surgical attire
  - a) Staff in the semi-restricted area is required to wear surgical attire which should cover the head and facial hair; whereas staff in the restricted area is additionally required to wear masks where open sterile supplies or scrubbed persons may be located.

b) Staff working in OR should avoid wearing artificial nails, nail embellishments, watches, rings or other wrist jewelry.

ii. Training

Staff involved should be trained and be competent to maintain the aseptic technique throughout the operation.

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