



# Guidelines on Infection Control & Prevention In Hotel Industry



衛生署  
Department of Health

# Acknowledgements:

1. Hong Kong Hotels Association and Hotel Food Safety & Hygiene Task Force
2. Food and Environmental Hygiene Department
3. Home Affairs Department
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6. Department of Health Infection Control Committee

## Photo Courtesy:

- Hong Kong Disneyland Hotel
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# 1. Introduction

Effective prevention and control of communicable diseases in hotels can safeguard the health of the hotel guests and staff. In order to uphold the reputation of Hong Kong as a world-class destination to overseas tourists, it is incumbent on every hotel staff to learn how to prevent communicable diseases. This guideline is intended to provide practical information on the preventive measures of communicable diseases for those who work in hotels. Every hotel employee has the responsibility to understand the guideline and to take due care of the hotel guests according to what has been laid down therein this guideline.

The guideline is divided into seven sections, individual employees may refer to the relevant sections if necessary. However, this set of guideline is not meant to be exhaustive. In case of doubt or when further information on specific communicable disease is needed, advice can be sought from the Infection Control Branch of the Centre for Health Protection of the Department of Health. Lastly, opportunity is taken to thank the Hong Kong Hotels Association and all the hotels who participated in the Infection Control Survey in Hotel Industry for their invaluable comments and inputs on the preparation of this guideline.

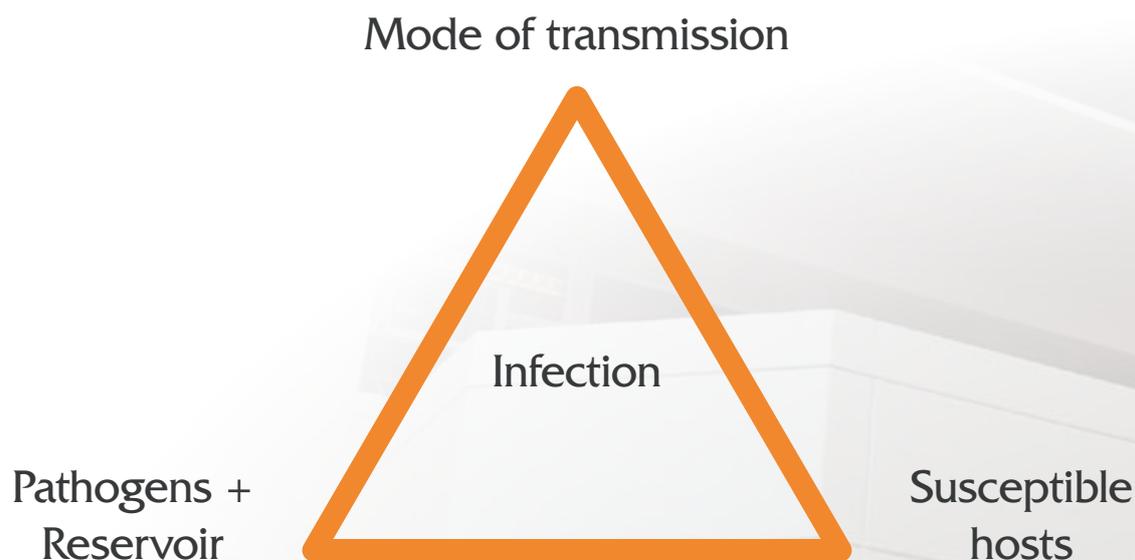
## 2. Concept of Communicable Diseases

### 2.1 Communicable Diseases

Communicable diseases refer to diseases that can be transmitted and make people ill. They are caused by infective agents (pathogens) e.g. bacteria and viruses, which invade the body and multiply or release toxins to cause damages to normal body cells and their functions. In severe cases, they may lead to death. These infective agents can spread from a source of infection (e.g. sick person) to a person through various modes of transmission.

### 2.2 Chain of Infection

For an individual to acquire an infection, a number of factors crucial to the spread of communicable diseases including the infective agents (pathogens), source of infection (reservoir), mode of transmission, and susceptible host must be present. This is called the chain of infection (Figure 1).



**Figure 1. Chain of Infection**

## 2. Concept of Communicable Diseases

### 2.3 Pathogens / Reservoir

#### 2.3.1 Pathogens

The pathogens/infective agents responsible for infectious diseases include bacteria, viruses or parasites. Some microorganisms are part of our own body flora which can cause infection when we are immunocompromised. These infections are called endogenous infections. Infections which are acquired from external sources are called exogenous infections. However, pathogens/infective agents must achieve an infective dose before they can infect people.

#### 2.3.2 Reservoir

This refers to any environment or object in or on which infective agents can survive and, in some cases, multiply. Human beings, inanimate objects, animals, food or water can all serve as reservoirs. Such reservoirs will normally form the basis for the origin of the infective agents to infect humans. A human reservoir may be either a case or a carrier. A case is a patient with an acute clinical infection while a carrier is a person who is incubating and/or colonized with a specific pathogenic microorganism but shows no signs or symptoms of infection. A carrier may have a subclinical or asymptomatic infection e.g. Hepatitis B virus.

### 2.4 Mode of Transmission

Infective agents can be transmitted from a source of infection to another person by contact, droplet, inhalation of infectious droplet nuclei, or ingestion. Some communicable diseases can be transmitted by more than one mode of transmission. Interruption of the mode of transmission is the easiest way to break the chain of infection, therefore, it is the key to prevent and control infectious diseases.

## 2. Concept of Communicable Diseases

### 2.4.1 Contact transmission

- Contact is the most common mode of transmission which can be subdivided into direct contact or indirect contact.
- Transmission through direct contact refers to person-to-person spread of microorganisms through direct physical body contact, such as by hands. For example, scabies.
- Transmission through indirect contact occurs when a susceptible person comes into contact with a contaminated object or environment, such as sharing towel. For example, acute conjunctivitis and community associated-methicillin-resistant *Staphylococcus aureus* (CA-MRSA).

### 2.4.2 Droplet transmission

- Droplet transmission occurs when the mucous membrane of the eyes, nose and mouth of a susceptible person come into contact with infectious droplets (> 5µm in size).
- These particles do not remain suspended in the air for extended periods of time, and usually do not travel beyond several feet (usually 1 metre or lesser) from the source person.
- These droplets are generated when the source person coughs, talks, sneezes, or spits. Examples of infections transmitted by droplet route include influenza and Severe Acute Respiratory Syndrome (SARS).

### 2.4.3 Airborne transmission

- Airborne transmission occurs when the airborne droplet nuclei ( $\leq 5\mu\text{m}$  in size) or dust particles containing microorganisms remain suspended in the air for a long period of time and then inhaled by the susceptible host. Examples of airborne infections are pulmonary tuberculosis and chickenpox.

## 2. Concept of Communicable Diseases

### 2.4.4 Common vehicle transmission

- Common vehicle transmission occurs when microorganisms are spread from contaminated food, water, or equipment. Examples of diseases transmitted through this route include food poisoning, cholera and Hepatitis A.

### 2.4.5 Vector-borne (insects) transmission

- Vector-borne (insects) transmission occurs when an invertebrate vector bites or touches a person. Examples of diseases transmitted through vector-borne (insects) transmission are dengue fever or malaria.

## 2.5 Susceptible Host

Human body normally has many defense mechanisms for resisting the entry and multiplication of pathogens. However, some people are at higher risk for infection because of their declined or immature immune systems. Examples of these susceptible hosts are elderly and newborn baby, immunocompromised people, steroid user, or patient who is recovering from serious trauma or after surgery.

## 3. Preventive Measures against Communicable Diseases

Apart from the general hygienic practice, hotel staff should also adopt basic infection control measures to prevent and control communicable diseases. These include Standard Precautions and Transmission-based Precautions.

### 3.1 Principles of Prevention and Control of Communicable Diseases

To prevent or control communicable diseases, appropriate infection control measures should be implemented promptly to control the infective agents (pathogens), source of infection (reservoir), mode of transmission, and the susceptible hosts so as to break the chain of infection. Examples of control measures are as follows:

<u>Chain of Infection</u>	<u>Infection Control Measures</u>
Infective agents	Disinfection and killing of all infective agents
Source of infection	Early detection, isolation and treatment of sick and removal of breeding sites
Mode of transmission	Maintain good environmental, personal and food hygiene; adopt infection control measures appropriate to the different modes of transmission
Susceptible host	Build up personal immunity by immunization and healthy lifestyles

### 3.2 General Hygiene Practices

Building up immunity by having a well balanced diet, adequate rest and sleep, regular exercise and being a non-smoker are all vital to the prevention of communicable diseases. Hotel staff should observe strict personal hygiene practice as follows:

## 3. Preventive Measures against Communicable Diseases

- Perform hand hygiene frequently with soap and water, or 70% alcohol-based handrub.
- Do not spit.
- Cover nose and mouth with tissue paper when sneezing or coughing and have the tissue paper discarded into lidded garbage bins afterwards.
- Individuals with signs and symptoms of respiratory infections (such as coughing, sneezing, headache etc.), respiratory hygiene/ cough etiquette (please refers to section 3.3.1 II) should be observed.
- If you feel unwell, you should seek medical advice promptly to prevent spreading the infection in hotel.
- Change and wash uniform frequently or whenever it is grossly contaminated.
- Do not share personal items such as towels and razors.
- Cover wound or cut with waterproof dressing.

### 3.3 Standard Precautions and Transmission-based Precautions

There are two tiers of precautions to prevent the transmission of infectious agents. Standard Precautions are intended to be applied to the care of all people regardless of the suspected or confirmed presence of an infectious agent. Transmission-based Precautions are for people who are known or suspected to be infected or colonized with infectious agents which require additional control measures to effectively prevent transmission (transmitted through contact, droplet or airborne notions etc as described in Section 2.4).

## 3. Preventive Measures against Communicable Diseases

### 3.3.1 Standard precautions

Standard precautions should be implemented when we have to contact blood; all body fluids, secretions and excretions except sweat; non-intact skin; and mucous membranes. Standard precautions include the following infection control measures:

- Hand hygiene
- Respiratory hygiene/cough etiquette
- Environmental hygiene and decontamination
- Personal protective equipment (PPE)
- Linen management

#### I. Hand hygiene

Hand hygiene is a general term referring to any action of hand cleansing. The common hand hygiene practices recommended include handwashing and use of alcohol-based handrub (hand antisepsis). Since many communicable diseases are transmitted through direct contact, performing hand hygiene properly is a basic infection control measure to prevent the spread of communicable diseases in hotels setting. When hands are visibly soiled, handwashing should be performed. When hands are not visibly soiled, application of alcohol-based handrub is equally effective.

#### Hand hygiene should be performed:

- Before touching mouth, nose and eyes,
- Before handling, preparing or serving food,
- After using tissue paper to cover the mouth and nose while sneezing or coughing,
- After using the toilet, or
- After touching public installations or equipment, such as escalator handrails, elevator control panels or door knobs.



### 3. Preventive Measures against Communicable Diseases

#### Hand hygiene technique

To achieve the best hand washing results, before performing hand hygiene, hotel staff should take off their watches, rings and accessories on hands and wash their hands properly according to the following procedures and make reference to Appendix A for the proper hand hygiene technique.

- Wet hands under running water.
- Apply liquid soap and rub hands together to make a soapy lather.
- Away from the running water. Rub the palms, back of hands, between fingers, backs of fingers, thumbs, finger tips and wrists for at least 20 seconds (same procedure also applies to disinfection of hands with alcohol hand rub).
- Rinse hands thoroughly under running water after rubbing.
- Dry hands thoroughly with clean cotton towel, paper towel or hand dryer. Towels for drying hands should never be shared.
- If necessary, turn off the tap by wrapping the faucet with paper towel. Avoid touching the faucet again with washed hands.



#### Provision of resources

Hotel management should ensure that materials for adhering to hand hygiene are available in hotel:

- Provide lidded receptacles for used tissue paper disposal.
- Provide conveniently-located dispensers of alcohol-based handrub; where sinks are available, ensure that supplies for handwashing (i.e., liquid soap and disposable towels) are consistently available.

## 3. Preventive Measures against Communicable Diseases

### II. Respiratory hygiene/ cough etiquette

Respiratory hygiene / cough etiquette is regarded as a kind of source control measures. Hotel staff/ hotel guests should be educated to perform the followings when they cough or sneeze:

#### Source control measures

- Cover mouth and nose when coughing or sneezing.
- Use tissue paper to contain respiratory secretions and dispose them promptly in lidded receptacles.
- Perform hand hygiene after hands have been in contact with respiratory secretions.
- Offer surgical masks to persons with respiratory symptoms when tolerated, especially during epidemic.
- Encourage persons with respiratory symptoms to sit away from others, ideally > 1 metre (or 3 feet).

#### Provision of resources:

Hotel management should ensure that materials for adhering to respiratory hygiene/cough etiquette are available in hotel:

- Provide lidded receptacles for used tissue paper disposal.
- Provide surgical masks when in need.

### III. Environmental hygiene and decontamination

Since infective agents can survive in the environment for a period of time, it is vital to observe environmental hygiene from time to time and environmental decontamination should be strengthened, in particular during outbreak situation.

### 3. Preventive Measures against Communicable Diseases

Environmental hygiene includes the followings:

#### General cleaning

- Rooms should be maintained at a reasonable standard of cleanliness.
- Cleaning should start in the clean areas and progress to the dirty areas.
- All surfaces should be cleaned at least daily with detergent and water or disinfectants (e.g., 1 in 99 diluted household bleach (5.25%) solution), if necessary.
- Frequently touched area such as escalator handrails, elevator control panels or door knobs should be cleaned more often subject to the frequency of use.
- Hands should be washed after undertaking cleaning activities.
- Regular pest control should be carried out.
- Supervisors should undertake regular monitoring to ensure that existing hygienic standards are strictly observed.

#### Handling of spillage

- Disposable gloves should be used if the cleaning involves contact with body fluids, such as respiratory secretions, urine, feces etc. Eye protection (i.e., goggles and faceshield) or body protection may be considered when substantial splash of blood or body fluids is anticipated.
- Use highly absorptive materials to preliminarily clean up the contaminated surfaces first.
- If the surface is contaminated with vomitus or other body fluids, disinfect with 1 in 49 diluted household bleach (5.25%) solution, leave for 15-30 minutes and then rinse with water; if the surfaces are contaminated with blood, use 1 in 4 diluted household bleach (5.25%) solution for disinfection of the contaminated surface and leave for 10 minutes before rinsing with water. [28]

## 3. Preventive Measures against Communicable Diseases

### Floors and floor coverings

- Carpets or rugs/mats may be vacuumed using a cleaner that does not throw dust into the air or steam cleaned if soiled with body fluids.
- Do not hang up and swat carpets or rugs/mats as this will create aerosols.
- Hard floor surfaces should be cleaned with wet vacuum systems. If wet vacuum systems are not available, hard floor surfaces should be damp mopped using detergent and water or disinfectant if necessary.

### Furnishing

- These include items such as curtains, drapes, screens, lampshades and furniture items which should be washed/cleaned or steam cleaned regularly.

### Lift cars and escalators

- Wipe lift cars and escalators, particularly the call buttons and handrails with detergent and water, or disinfected with 1 in 99 diluted household bleach (5.25%) solution, if necessary.
- Clean lift ventilation vans regularly.

### Hotel lobby

- Regularly wash and wipe building entrances, door knobs/handles with detergent and water, or 1 in 99 diluted household bleach (5.25%) solution, if necessary.



### 3. Preventive Measures against Communicable Diseases

#### Public toilets and toilets of the guest rooms

- Clean public toilets with 1 in 99 diluted household bleach (5.25%) solution frequently.
- Every public washroom should be equipped with liquid soap, paper towels or hand dryer(s).
- Clean toilets of the guest rooms at least once a day. Wipe the rim, seat and lid of the toilet bowl with 1 in 99 diluted household bleach (5.25%) solution, rinse with water and then wipe dry.
- Make sure that the drain pipes are built with U-shaped water traps; do not alter the pipelines without authorization.
- Clean floor drain outlets at least once a week to prevent putrid air and insects in the soil pipes from entering the premises. Pour about half a litre of water into each drain outlet regularly (about once a week) so as to maintain the water column in the pipe as water lock.

Environment decontamination is crucial when:

#### Under outbreak situation

- Disinfect the environment with 1 in 49 diluted household bleach (5.25%) solution, leave for 15-30 minutes before rinsing with water and mopping dry. [28]
- Special attention should be paid to the disinfection of toilets, kitchens and objects which are frequently touched such as light switches, door knobs and handrails. [28]

## 3. Preventive Measures against Communicable Diseases

### IV. Personal protective equipment (PPE)

Personal Protective Equipment (PPE) is specialized clothing or equipment worn by an employee for protection against infectious materials. It should serve as a last resort that should not replace any other risk control and infection control measures. However, sufficient stock of PPE should be kept to ensure its provision to protect employees from exposure to infectious agents in the workplace. The common PPE used for prevention of infectious diseases transmission are as follows:

#### Surgical mask

- Wear a surgical mask to protect mucous membranes of the nose and mouth during procedures that are likely to generate splashes or sprays of blood, body fluids, secretions, and excretions, (for example, in case of handling or segregating heavily soiled linen sheets or laundering items of hotel guests.)

#### Particulate respirator

- Put on a particulate respirators (e.g., N95 respirator) for conducting of maintenance work for cooling tower such as testing and commissioning, inspection, water sampling and high pressure spraying etc.

#### Gloves

- Wear disposable gloves when touching blood, body fluids, secretions, excretions, or mucous membrane or contaminated items.
- Remove gloves promptly after use and perform hand hygiene immediately.
- Gloves do not replace hand hygiene.



### 3. Preventive Measures against Communicable Diseases

#### Gown or apron



- Wear gown or apron to protect skin or trunk and to prevent soiling of clothing during procedures that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions.
- Wear a coverall for conducting high pressure water spraying during ventilation system maintenance or when substantial whole body contamination is anticipated.
- Remove soiled gown as promptly as possible and perform hand hygiene to avoid transfer of microorganisms to other people or environments.

#### Goggles / Face shield



- Wear a goggles / face shield to protect the mucous membrane of the eyes when carrying out procedure that are likely to generate splashes or sprays of blood or body fluids of the guests (e.g., handling of heavily soiled linen sheets or cleaning or changing dust filters of the ventilation system).
- Wear goggles / face shield when conducting high pressure water spraying for ventilation system maintenance.
- Ordinary spectacles do not provide adequate protection.
- Goggles / face shield should be changed after procedure or whenever contaminated. Reusable goggles / face shield should be washed and decontaminated in accordance with manufacturer's instructions.

\* In order to reduce the chance of cross contamination, please also make reference to Appendix E for the suggested sequences of putting on and removing personal protective equipment after use.



## 3. Preventive Measures against Communicable Diseases

### V. Linen management

Used linen should be handled as little as possible with minimum agitation to prevent possible contamination of the handler or environment. [6, 7, 9] Clean linen should be stored in the closed cabinet [42] and handled, processed & transported separately from the used linen, [9] and linen should be changed regularly and whenever a guest has checked out.

#### Packing

- Bagged at point of generation.[6]
- Rolling technique: wrap up the soiled part to the centre of the bundle. [7]
- Volume of each load should not exceed 2/3 of the laundry bag.If linen is to be sent for outsource treatment,
  - Packed with a leak resistant bag for soiled linen.[ 6, 7]
  - Tied at the neck of the bag tightly.

#### Linen laundering – Standard laundering procedure

##### For washable items

Examples of washable items include bed sheets, pillowcases, towels & cotton blankets.

##### Pre-wash

- Allows warming and mixing up the content of washing machine to remove the soiled matter. [6]

##### Main wash

- Hot temperature wash: 71°C for  $\geq 3$  minutes or 65°C for  $\geq 10$  minutes.[5, 6, 8, 10 ] OR
- Cold temperature wash: 20°C with bleach (60-150 parts per million (ppm) available chlorine). [7, 11, 12 ] OR
- Ozone washing is a relatively new method that allows ambient temperature washing cycle, that is 32°C to 35°C. [13, 14] Please refer to manufacturer's recommendation for set up of ozone concentration.



### 3. Preventive Measures against Communicable Diseases

#### Rinsing

- Rinsing removes all of the detergent and additives from linen by dilution. [15]

#### For non-washable items

Examples of non-washable items include mattresses & pillows.

- The plastic cover should be wiped with 1 in 99 diluted household bleach (5.25%) solutions. The integrity of the plastic cover should be checked before wiping.
- In case of being contaminated with body fluid, mattress without plastic cover should be steam-cleaned, pillow without plastic cover should be washed as standard laundering procedure or dry-cleaned. [9]
- For woollen blankets, it should be washed in warm water, and then dried under the sun or in dryers under cool temperature, or dry-cleaned. [9]
- For quilts, it should be washed in hot water and detergent, then rinsed and dried preferably in a dryer or under the sun, or dry-cleaned.

#### Handling of the soiled linen

- Solid and bulky waste should be cautiously removed first.
- It should hence be handled as standard laundering procedure.
- Disposable gloves should be used when handling the soiled linen contaminated with blood, excreta or body fluids. [ 7]
- Gown / apron should be worn if cleaning procedure poses any risks of contamination of skin or working cloths.[ 7]



## 3. Preventive Measures against Communicable Diseases

### 3.3.2 Transmission-based Precautions

There are three categories of Transmission-based Precautions: Contact Precautions, Droplet Precautions, and Airborne Precautions. For some diseases that have multiple routes of transmission (e.g., SARS), more than one Transmission-based Precautions category may be used. When used either singly or in combination, they are always used in addition to Standard Precautions.

Contact precautions are designed to reduce the risk of infectious diseases transmission by direct or indirect contact when handling of infective materials such as changed linen sheets. Appropriate PPE should be worn, in accordance with Part IV in the above, when contact with sick guests or contaminated environmental surface or items is anticipated.

Droplet precautions are designed to reduce the risk of droplet transmission of infectious agents (e.g., influenza, rubella, SARS etc) while airborne precautions are designed to reduce the risk of infectious diseases, such as pulmonary tuberculosis and chicken pox, transmitted by small droplet particulates (i.e. droplet nuclei).

### 3. Preventive Measures against Communicable Diseases

For sick guests who present respiratory symptoms such as coughing, sneezing and fever, place a surgical mask on the sick guest if he/she could tolerate in order to minimize the dispersal of droplet or droplet nuclei. Advise the sick guests to seek medical attention and avoid any mass assembling activities. It is recommended to ask the guest with airborne infectious diseases (e.g., pulmonary tuberculosis and chicken pox) to put on a surgical mask, stay in a single room, stop participating any mass assembling, and immediately seek medical help. If it is practically possible, it is also recommended to minimize contacts between the sick guest and hotel staff. Hotel staff should wear a surgical mask for attending the sick guest, if necessary. Thorough decontamination (see part III under section 3.3) of the room housing the sick guest should be performed upon the guest check out. For personal protection of staff members in hotels, please refer to Part IV in the above.

#### 3.4 Ventilation

This refers to the process of supplying and removing air to and from a building, which could be achieved by natural and mechanical means. Natural ventilation is usually characterized by uncontrolled inward and outward air leakage through cracks, windows, doorways and vents. Premises relying entirely on natural ventilation should have openings of at least 5 to 10% of the floor area to obtain adequate ventilation in the summer. [1] Mechanical ventilation is provided by air movers or fans in the wall, roof or air-conditioning system, which promotes supply and exhaust air flow in a controllable manner.

## 3. Preventive Measures against Communicable Diseases

### 3.4.1 Purpose of ventilation

- Provide fresh and clean air to maintain a thermally comfortable work environment, and to remove or dilute airborne contaminants.
- Maintain the temperature and humidity within acceptable range.

### 3.4.2 General ventilation design

- Good air flow is very important.
- Adequate ventilation can maintain the freshness of air, prevent accumulation of heat and control the level of airborne contaminants.
- Carbon dioxide level of higher than 1,000 ppm may indicate the insufficiency of indoor ventilation. [1, 2]
- The location of fresh air intake points should be carefully designed to prevent intake of contaminated air.
- Optimum temperature of 20°C – 26°C. [3]
- Optimum humidity of 40% - 70%. [3]
- Avoid blocking of air flow from the supply registers.
- Too much air movement causes draughts which are annoying, if too little, people may complain of stuffiness.
- Adjust diffusers and return air grilles properly.
- Regular maintenance to keep the ventilation system clean and functioning properly.

## 3. Preventive Measures against Communicable Diseases

### 3.4.3 Infection control measures and ventilation issues

- Microorganism such as mould or fungi, bacteria, viruses, protozoa etc can be found indoors.
- Mould or fungal growth on structural materials is a sign that biological growth in the area is flourishing.
- High air humidity, stagnant water, filters packed with dusts and building structures that have been damaged by moisture all provided favorable conditions for biological growth.
- Use efficient filters in ventilation unit to remove airborne particulates and spores of microorganisms from the ventilation system.
- Remove potential water sources that may encourage fungal growth, especially stagnant water in ventilation systems.
- Repair and maintain all water pipes and draining systems.
- Repair areas that have been affected by flood or seepage.
- Remove and replace contaminated porous materials, such as heavily deposited ventilation unit filters, moldy ceiling tiles and mildewed carpets.
- Disinfect all smooth surfaces (such as wall tiles) that have been contaminated by fungi.
- Provide dehumidifier units for control of humidity within the optimum range.

## 3. Preventive Measures against Communicable Diseases

### 3.4.4 Maintenance of Mechanical Ventilation Systems

- Proper inspection, cleaning, testing and maintenance schedules should be drawn up and followed.
- Replace air filters regularly.
- Inspect all components of the ventilation system for cleanliness and microbial growth regularly, and clean them as required.
- Test the performance of the system against the design specification and make necessary adjustment or repair.
- If water cooling towers are used, they should be so maintained, e.g., use of biocides as appropriate, as to prevent the growth of micro-organisms (please refer to the Table 1 and 2 below for the water quality of water cooling towers).
- Ventilation system should function properly and be regularly maintained.
- Air-conditioning systems should be cleaned according to the manufacturer's instructions.
- Filters should be changed or cleaned according to the manufacturer's instructions. Staff should put on appropriate PPE (such as goggles and gloves etc) when changing the filter. [4]
- Grilles and air ducts should be cleaned regularly.

### 3.4.5 Cooling Water Quality Monitoring

- Regular monitoring of specific water quality parameters can provide an early signal before abnormal condition is detected. This monitoring should be conducted on regular basis. Indicative freshwater and sea water quality criteria are provided in the Table 1 and 2 below. However, the owners / operators of the cooling tower system shall develop their own quality monitoring schedules to suit their systems.

### 3. Preventive Measures against Communicable Diseases

<u>Parameters</u>	<u>Cooling Water Quality Criteria</u>
Heterotrophic colony count	Less than 100,000 cfu/mL
Legionella bacteria count	Less than 10 cfu/mL
Conductivity	Less than 1500 µS/cm
Total dissolved solids	Less than 1500 ppm
Suspended solids	Less than 180 ppm
Calcium hardness	Less than 500 ppm
pH	8 ~ 10
Total alkalinity	80 ~ 500 ppm
Oxidizing biocide	Follow manufacturer's specifications
Inhibitor level	Follow manufacturer's specifications
Temperature	Optimal temperature for the system design and current operating conditions
Chlorine as mg/L Cl	Less than 200 mg/L
Sulphate as mg/L SO <sub>4</sub>	Less than 200 mg/L
Total iron as mg/L Fe	Less than 1.0 mg/L
Residual Cl	Less than 0.3 ppm
BOD <sub>5</sub>	Refer to EPD's Technical Memorandum on Standards for Effluent Discharged into Drainage and Sewerage Systems, Inland and Costal Water
COD	
Metal ions	

Table 1: Indicative cooling water quality table for fresh water type cooling tower [4]

### 3. Preventive Measures against Communicable Diseases

#### Parameters Cooling

Heterotrophic colony count  
 Legionella bacteria count  
 Total dissolved solids  
 Suspended solids  
 pH  
 Total alkalinity  
 Oxidizing biocide  
 Inhibitor level  
 Temperature  
  
 Chlorine as mg/L Cl  
 Total iron as mg/L Fe  
 BOD5  
 COD  
 Metal ions

#### Water Quality Criteria

Less than 100,000 cfu/mL  
 Less than 10 cfu/mL  
 Less than 100,000 ppm  
 Less than 180 ppm  
 8 ~ 10  
 200 ~ 350 ppm  
 Follow manufacturer's specifications  
 Follow manufacturer's specifications  
 Optimal temperature for the system design and current operating conditions  
  
 Less than 70,000 mg/L  
 Less than 1.0 mg/L  
 Refer to EPD's Technical Memorandum on Standards for Effluent Discharged into Drainage and Sewerage Systems, Inland and Coastal Water

Table 2: Indicative cooling water quality table for sea water type cooling tower [4]

# 4. Facts About Common Communicable Diseases

## 4.1 Foodborne Disease & Specific Preventive Measures

### 4.1.1 Foodborne disease

#### I. Norovirus

Acute gastroenteritis in humans is usually caused by a group of viruses known as Norwalk-like viruses, also known as small round structured viruses (SRSVs).

Food can also be contaminated at its source, and oysters from contaminated waters. Noroviruses are relatively resistant to environmental challenge: they are able to survive freezing, temperatures as high as 60°C, and have even been associated with illness after being steamed in shellfish. Moreover, noroviruses can survive in up to 10ppm chlorine, well in excess of levels routinely present in public water systems.

#### Clinical features

- Usually self-limiting.
- With symptoms of acute-onset vomiting, watery non-bloody diarrhea with abdominal cramps, and nausea.
- Low-grade fever also occasionally occurs, and vomiting is more common in children.
- The incubation period is usually between 24 and 48 hours (median in outbreaks 33 to 36 hours), but cases can occur within 12 hours of exposure.
- Often cause outbreaks of gastroenteritis in common settings including restaurants and catered meals. Isolated cases of the disease also occur among people of all age groups.

## 4. Facts About Common Communicable Diseases

### Mode of transmission

- Primarily through the fecal-oral route, either by consumption of fecally contaminated food or water or by direct person-to-person spread.
- Environmental and fomite contamination may also act as a source of infection.
- Transmission is also due to aerosolization of vomitus that presumably results in droplets contaminating surfaces or entering the oral mucosa and being swallowed.
- Waterborne outbreaks of norovirus disease in community settings have often been caused by sewage contamination of wells and recreational water.

### II. *Salmonella*

Food Poisoning is usually caused by *Salmonella*. Approximately 2000 serotypes cause human disease. *Salmonella* bacteria live in the intestines of human and many food animals, such as cows and chickens, and commonly contaminate foods of animal origin. People get *Salmonella* infection by ingesting these germs, usually in contaminated food or water, but also by putting objects or fingers contaminated with these germs into the mouth.

### Clinical features

- Common symptoms include vomiting, diarrhoea and abdominal pain, with or without fever.
- Serious complications, such as dehydration and septicaemia leading to death may occur when appropriate treatment is delayed, but these are rare.
- The incubation period is usually between 12 and 72 hours. The illness usually lasts 4 to 7 days.
- Occasionally can establish localized infection (e.g., septic arthritis) or progress to sepsis.

## 4. Facts About Common Communicable Diseases

### Mode of transmission

- By consumption of contaminated food, water, or contact with infected animals.

### III. Hepatitis A

Hepatitis A virus (HAV) is classified as a picornavirus. Primates are the only natural host. Hepatitis means inflammation of the liver cells. It can be caused by infection, alcohol, drugs, chemicals and hereditary diseases. Hepatitis A is one form of viral hepatitis caused by Hepatitis A virus.

### Clinical features

- Usually begins with symptoms such as fever, anorexia, nausea, vomiting, diarrhea, upper abdominal discomfort, muscle pain, and malaise.
- Jaundice, dark-colored urine, or light-colored stools might be present at onset or might follow constitutional symptoms within a few days.
- The incubation period is usually around 28 days (range: 15–50 days).
- The illness lasts a few weeks but may rarely take months.
- Most patients have a complete recovery but in a few cases, the damage on the liver may be prolonged. Immunity is usually life-long and there is no chronic carrier state.

### Mode of transmission

- Occurs by fecal-oral route, either by direct contact with an HAV-infected person or by ingestion of HAV-contaminated food or water.

## 4. Facts About Common Communicable Diseases

### 4.1.2 Preventive Measures of Foodborne Diseases

- Keep the premises and kitchen utensils clean.
- Dispose rubbish properly.
- Keep hands clean and fingernails trimmed.
- Wash hands properly with soap and water before eating or handling food, and after toilet or changing diapers.
- Drinking water should be from the mains and preferably boiled.
- Purchase fresh food from reliable sources. Do not patronize illegal hawkers.
- Avoid high risk food like shellfish, big coral reef fish, raw food or semi-cooked food.
- Wear clean washable aprons and caps during food preparation.
- Clean and wash food thoroughly.
- Store perishable food in refrigerator, well covered.
- Handle and store raw and cooked food separately (upper compartment of the refrigerator for cooked food and lower compartment for raw food) to avoid cross contamination.
- Clean and defrost the refrigerator regularly and keep the temperature at or below 4°C.
- Cook food thoroughly.
- Do not handle cooked and ready-to-serve food with bare hands; wear gloves if necessary.
- Consume food as soon as it is done.
- If necessary, refrigerate cooked leftover food and consume as soon as possible. Reheat thoroughly before consuming. Discard any addled food items.
- People at high risk of Hepatitis may consider receiving Hepatitis A vaccination.

## 4. Facts About Common Communicable Diseases

### 4.2 Respiratory Disease & Specific Preventive Measures

#### 4.2.1 Respiratory disease

##### I. Legionnaires/Pontiac fever

Legionellosis is an infection caused by the bacterium *Legionella species*. *Legionellae* survive and multiply in natural fresh water, including lakes, rivers, streams, ponds, mud and soil, as well as man-made water systems. The optimum temperature for proliferation of the bacteria is around 20°C to 45°C, and particularly in the range of 35°C to 43°C. The proliferation ceases above 46°C and below 20°C, while the survival time decreases to a few minutes at above 60°C. At 70°C the organism is killed virtually instantaneously. The bacteria can hardly survive in salt water and domestic water supplies which is chlorinated. Over 42 species of *Legionellae* have been identified and the *Legionella pneumophila* serogroup 1 is most commonly responsible for Legionnaires' disease and outbreak. The disease has two distinct forms:

- Legionnaires' disease, the more severe form of infection which includes pneumonia
- Pontiac fever, a milder illness which is self-limiting

#### Clinical features

- Typically manifested as severe pneumonia, with symptoms of high fever over 39°C, malaise, unproductive cough, chills, muscle ache, headache and breathless, and confusion, some often culminating in respiratory failure.
- Pontiac fever is a milder form of Legionellosis. Patients usually present with fever, headache and muscle ache, which last for about two to five days. Symptoms usually resolve and patients get well without any medical treatment.

## 4. Facts About Common Communicable Diseases

- The incubation period is 2 to 10 days.

### Route of transmission

- By inhalation of airborne droplets (i.e. aerosols) or particles in fine mist containing the bacteria into the lungs where they are deposited.
- According to the previous reported cases, the sources of the aerosols causing an outbreak were mainly traced to water systems in buildings including evaporative cooling towers and humidifiers of air-conditioning systems, hot and cold water services, fountains / sprinkler systems, whirlpool and spas, industrial heating and cooling processes, etc. normal range of operation temperature of these systems is conducive to the growth of Legionellae.
- There is no evidence of person to person spread.

### Preventive Measures for Legionnaires/Pontiac fever In Air-conditioning System

- Remove all potential nourishing water source (e.g., stagnant water in drip pans, cooling coils and sumps).
- Clean humidifiers or ventilation units regularly.
- Use air cooled condensers instead of freshwater cooling towers.
- If freshwater cooling tower is used, effective dosage of chemicals and biocides should be added to the water tanks of the cooling tower to prevent growth of algae and bacteria.

## 4. Facts About Common Communicable Diseases

### For Fountains

- The fountains should be built with materials that make it easy to clean and maintain, such as stainless steel. Since the smooth surface is simple for cleaning that also minimizes the chance for bacterial growth.
- Fountain is recommended to be placed with some distance from the unprotected furniture, electrical appliances and food serving area services.
- Replace water regularly. Complete changing of water and cleaning the fountain periodically, usually in 1 to 4 months intervals or as follow the instructions provided by the manufacturer, is desirable
- If the fountain is placed in direct sunlight, the frequency of cleaning should be increased to prevent the growth of algae.
- The reservoir and the pump should be cleaned thoroughly after the draining out of water. All debris and sludge should be rinsed and removed before re-operation.
- 1 in 99 diluted household bleach (5.25%) solution can be used for general disinfecting purpose or other cleansing agent as suggested by the manufacturer.

### II. Influenza-like illness (ILI)

Influenza-Like illness (ILI) is a nonspecific respiratory illness. Respiratory pathogens that may present with an ILI include viruses such as influenza virus, respiratory syncytial virus (RSV), adenovirus, rhinovirus and parainfluenza virus, as well as bacterial pathogens such as *Chlamydia pneumoniae*, *Legionella* sp., *Mycoplasma pneumoniae* and *Streptococcus pneumoniae*. Influenza, RSV and certain bacterial infections are particularly important causes of ILI because can lead to serious complications.

## 4. Facts About Common Communicable Diseases

### Clinical features

- Characterized by clinically unexplained fever  $\geq 38^{\circ}\text{C}$  and, respiratory symptoms of cough and / or sore throat, muscle pain and headache.
- The incubation period is 1 to 5 days.

### Route of transmission

- Droplets of respiratory secretions are believed to be the primary means of person-to-person influenza transmission.
- Spread can also occur through direct person-to-person contact or through fomites.

### III. Avian Influenza

Avian influenza (H5N1) virus is one type of Influenza A virus. It is known previously to infect birds only, cross species infections have been documented in 1997 and 2003 in Hong Kong affecting 18 and 2 human cases respectively. It then causes millions of poultry deaths and

### Clinical features

- Avian influenza has similar clinical presentation as human influenza.
- However, it runs a more rapid downhill course resulting in high fever, chest infection, respiratory failure, multi-organs failure, and even death.

### Route of transmission

- Avian Flu is transmitted from infected live birds to man.
- Transmission between humans is very inefficient.

## 4. Facts About Common Communicable Diseases

### Preparedness Plan for Influenza Pandemic

#### Hong Kong Government Response Systems

- The Government's plan includes a three-level response system (Alert Response Level, Serious Response Level and Emergency Response Level).
- These levels are based on different risk-graded epidemiological scenarios relevant to Hong Kong, and each of them prescribes a given set of public health actions required. For more details, you may refer to the "Preparedness Plan for Influenza Pandemic" ([https://www.chp.gov.hk/files/pdf/erib\\_preparedness\\_plan\\_for\\_influenza\\_pandemic\\_2014\\_eng.pdf](https://www.chp.gov.hk/files/pdf/erib_preparedness_plan_for_influenza_pandemic_2014_eng.pdf)).
- They are designed to match with the World Health Organization (WHO)'s guideline for pandemic influenza planning.
- According to WHO, preparedness activities for influenza pandemic should include surveillance, investigation and control measures, laboratory support, infection control measures, provision of essential medical services, antiviral stockpiling, vaccination, port health measures, and communication.

## 4. Facts About Common Communicable Diseases

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## 4. Facts About Common Communicable Diseases

### IV. Severe Acute Respiratory Syndrome (SARS)

Severe acute respiratory syndrome (SARS) is a viral respiratory infection caused by a coronavirus (SARS-CoV).

#### Clinical features

- The initial symptoms are influenza-like.
- Usually begin with fever, which is often high (38°C or above), and sometimes associated with chills, rigors, headache, malaise, muscle pain or even diarrhoea.
- At the onset of illness, some patients may only have mild respiratory symptoms. After a few days, symptoms of lower respiratory tract infection may follow, including cough without sputum and difficulty in breathing.
- In around 10% of patients, the illness may rapidly progress to respiratory failure requiring intensive medical care. Symptoms can be more variable among elderly patients.
- Symptoms usually appear within 2 to 7 days after contracting the disease, but the incubation period can be up to approximately 10 days.

#### Mode of transmission

- Predominantly transmitted through close person-to-person contact, especially via respiratory droplets produced when an infected person coughs or sneezes.
- Droplet spread can take place when droplets from the cough or sneeze of an infected person are propelled a short distance and deposited on the mucous membranes of the mouth, nose, or eyes of persons who are nearby.
- The virus can also spread when a person touches a surface or object contaminated with infectious droplets and then touches his or her mouth, nose, or eyes.

## 4. Facts About Common Communicable Diseases

### Preventive measures of respiratory disease

#### I. General Practices:

- Maintain good personal and environmental hygiene.
- Ensure good ventilation.
- Maintain proper function of toilets, drains and pipes.
- Cover nose and mouth with tissue paper while sneezing or coughing, and dispose nasal and mouth discharge properly.
- Keep hands clean and wash hands properly: before touching eyes, nose and mouth, if there is a need to do so; after handling objects soiled by faeces, respiratory or other body secretions; after touching public installations or equipment, such as escalator handrails, elevator control panels or door knobs.
- People with symptoms of respiratory tract infection or fever should wear a mask and consult a doctor promptly. Let the doctors know the travel history
- People returning from endemic areas should consult doctors promptly if they have symptoms of respiratory diseases after the trip.

#### II. Specific Practices -Avian Influenza

- During the "flu" season, it is better to avoid crowded public places where the ventilation is not good.
- Influenza vaccine is prepared according to the prevalence of strains in the community each year, as recommended by the World Health Organisation.
- Droppings of infected live birds and poultry may carry the Avian Flu virus, therefore, one should avoid touching live birds and poultry and their droppings.
- If you have been in contact with live birds and poultry, wash hands thoroughly with liquid soap and water immediately.

## 4. Facts About Common Communicable Diseases

- If you keep live bird at home, avoid close contact with the pet and wash hands thoroughly with liquid soap each time after touching it or after cleaning its droppings.
- Schools and nurseries should take measures to prevent children from coming into contact with live birds.
- Poultry and eggs should be thoroughly cooked before eating.
- When traveling outside Hong Kong, avoid touching live birds and poultry.

### 4.3 CA-MRSA and Specific Preventive Measures

#### 4.3.1 CA-MRSA

Staphylococcus aureus is a bacterium commonly found on human skin and mucosa. About a third of normal healthy people may carry this bacterium in the nose or on skin without infection. Occasionally, this bacterium gets into the body and causes disease, such as skin infection, wound infection, food poisoning, urinary tract infection, pneumonia and infection of blood stream.

Most strains of Staphylococcus aureus are sensitive to many antibiotics and infections can be effectively treated. However, those strains that are resistant to the antibiotic methicillin (methicillin-resistant Staphylococcus aureus, MRSA) are usually resistant to other commonly used antibiotics such as penicillins and cephalosporins. It is widely recognised that indiscriminate use of antibiotics may contribute to antibiotic resistance.

## 4. Facts About Common Communicable Diseases

In the past, MRSA infections commonly occurred in institutionalised persons and hospitalised patients. In recent years, many countries observe MRSA infections in healthy individuals who have not been hospitalised or stayed in other healthcare facilities or institutions, nor received medical procedures in the past 1 year prior to symptom onset. They are known as community associated- MRSA (CA-MRSA) infections and usually have different patterns of antibiotic resistance. The medical profession concerns about the emergence of CA-MRSA.

### Clinical features

- Commonly causes skin or soft tissue infections (pimples, boils or abscesses).
- Symptoms may include redness, warmth, swelling, skin tenderness or pus drainage.
- Sometimes more serious effects such as purulent wound infections and severe pneumonia may occur, requiring hospitalisation and special antibiotics for treatment.

### Mode of transmission

- Direct contact with wounds, discharge and soiled areas, usually via hands which may then contaminate other body sites, items or surfaces.
- Risk factors include close body contact, presence of openings in the skin such as cuts or abrasions, crowded conditions, and poor personal hygiene.
- The bacteria can be carried by healthy individuals, usually in nasal cavity, hair and armpit regions, and these carriers may pass the bacteria to other people.

## 4. Facts About Common Communicable Diseases

### 4.3.2 Preventive measures of CA-MRSA

- Keep hands clean by washing thoroughly and frequently with liquid soap and water, or by rubbing them properly with alcohol handrub.
- Wear gloves whenever it is necessary to touch grossly soiled objects, (e.g. saliva, pus discharge of other household members or pets), and wash hands thoroughly afterwards. This is especially important for immunocompromised persons.
- Avoid sharing personal items such as unlaundered towels, clothing or uniforms and razors.
- Avoid direct contact with wounds or anything contaminated by wound secretions.
- Clean any broken skin such as abrasions or cuts immediately and cover properly with waterproof adhesive bandages. Wash hands before and after touching wounds. Consult a doctor promptly if symptoms of infections develop.
- Avoid contact sports and visiting public bath houses if you have an open wound.
- Maintain environmental cleanliness and sterilize reused equipments in public places such as sports centre and public bathroom.
- Do not take antibiotics indiscriminately. Antibiotics should be prescribed by registered medical practitioners and the patient should complete the whole course of treatment according to the prescribed dosage and frequency.
- Observe strict hand hygiene and wear mask (for those with respiratory symptoms) if individuals are taking antibiotics.

## 4. Facts About Common Communicable Diseases

### 4.4 Statutory Notifiable Communicable Diseases

Some communicable diseases are highly infectious and cause severe consequences to such an extent that they threaten human lives and affect the economy. If there are proper precautionary or control measures in place, the disaster posed by these communicable diseases can be averted. To safeguard public health and safety, every country or region has legislation stipulating certain communicable diseases as statutory notifiable diseases which warrant special precautions, and policies are developed to prevent outbreaks and to contain their spread.

At present, there are 45 statutory notifiable communicable diseases under the Prevention and Control of Disease Ordinance (Cap. 599) in Hong Kong. The list is attached in Appendix B. (The list may be amended subject to prevailing public health need and policy).

All registered medical practitioners are required to notify the Central Notification Office (CENO), Centre for Health Protection (CHP) of the Department of Health all suspected or confirmed cases of these diseases. Medical practitioners are also advised to report other diseases and conditions that are of public health concern. The Centre for Health Protection will conduct surveillance and control of these diseases.

# 5. Outbreak of Communicable Diseases

## 5.1 Outbreak of Communicable Diseases

The hotel management should keep a clear staff sick leave record, and document usual number of sick staff. If the guests or staff in a hotel develop similar symptoms one after another and the incidence rate is higher than that at ordinary times, this is an outbreak from the epidemiological point of view. An example is cited below for reference.

- Two or more people develop similar symptoms after eating common food items. This means that a cluster of food poisoning may have occurred. The infective agent may be bacteria, viruses or toxins contained in the food.

## 5.2 Management of Outbreak of Communicable Disease

### 5.2.1 Infection control measures during outbreak

- If hotel guests/staff are suspected to have contracted a communicable disease, they should be temporarily isolated and prompt medical treatment should be arranged.
- Appropriate infection control measures should be implemented as soon as possible (e.g. hotel guests/staff with respiratory symptoms should put on surgical mask during respiratory outbreak) to prevent further spread of the infection in hotel.
- Group activities among sick hotel guests should be avoided.

## 5. Outbreak of Communicable Diseases

### 5.2.2 Disinfection of environment

- During outbreak situation, disinfect the environment with 1 in 49 diluted household bleach (5.25%) solution, leave for 15-30 minutes before rinsing with water and mopping dry. Special attention should be paid to the disinfection of toilets, kitchens and objects which are frequently touched such as light switches, door knobs and handrails.
- Use highly absorptive materials to preliminarily clean up surfaces contaminated with vomitus/excreta/secretions before performing the above disinfection procedure.

## 5.3 Recommendations on Management of Specific Communicable Diseases

### 5.3.1 Food poisoning

- List names of people suspected to be infected and information on food consumed within several days before the outbreak for use by the Department of Health during investigation.
- Save food remnants for investigation.
- Disinfect articles or places soiled by excreta or vomitus.
- Clean and disinfect toilets with 1 in 49 diluted household bleach (5.25%) solution.
- Ensure good personal, food and environmental hygiene in the hotel.
- Maintain a hygienic environment in the kitchen and make sure that the refrigerator works properly.
- Infected staff, especially food handlers, should be granted sick leave to prevent spread of the disease.

## 5. Outbreak of Communicable Diseases

### 5.3.2 Outbreak of respiratory tract infection

- List names of people suspected to be infected.
- Adjust the Mechanical Ventilation and Air Conditioning System (MVAC) and open windows if possible, to improve indoor ventilation and allow more fresh air intakes.
- Be stringent with personal and hand hygiene and observe for respiratory hygiene/cough etiquette.
- Group / assembling activities should be suspended during the outbreak period.
- Sick staff should refrain from work until fully recovered.

## 6. Infection Control Measures in Special Facilities

Hotel guests who have a fever, cough, respiratory symptoms or any signs of infection should not use common showers, saunas, Jacuzzis or spas (such as those provided in hotel health clubs or gyms) as moist atmosphere will aggravate the spread of respiratory viruses.

### 6.1 Swimming Pools and Whirlpool Spas

Acute conjunctivitis, Legionella's diseases, Pseudomonas dermatitis and Cryptosporidiosis are common communicable diseases that could be transmitted in swimming pools or in whirlpool spas settings. Persons with signs and symptoms of communicable diseases, such as fever, cough, red eye syndrome or non-intact skin conditions should be prohibited from using the swimming pool.

Pictorial signage should be displayed conspicuously at the entrance of the swimming pool area to alert hotel guests of this restriction and to advise users not to spit or urinate in the pool. Staff member should advise any persons with signs and symptoms of communicable diseases to leave the pool and seek medical advice as soon as possible.

Measures such as strengthening of the surveillance of the water quality and the disinfection system of the swimming pool are of paramount importance to prevent infectious disease transmission.

#### 6.1.1 Environmental cleansing

##### I. Daily cleansing routine

- The water of the pool should be completely changed by circulation through a filtration system or by removal from source in the frequency of not less than once in every 4 hours for a covered swimming pool and not less than once in every 6 hours for an open air pool during which the swimming pool is in use by bathers. [29]
- Remove grease on water surface, hair and visible dirt (with the help of vacuum where necessary).



## 6. Infection Control Measures in Special Facilities

- The whole area and all the facilities of the swimming pool and spa (including walls, floors, equipment, tables and chairs, stepways, handrails, diving boards, chutes, changing rooms, showers, foot baths, lockers and latrine fitment) should be kept clean.
- Regular cleansing and disinfection should be carried out at least once a day by using diluted household bleach (e.g. 1 in 99 diluted household bleach (5.25%) solution) and hence rinse with water and mop dry. [30]
- Dry any collection of water puddles around the pool, especially at corners and sewage exhaust, to prevent the formation of breeding ground for mosquitoes and germs.
- Scales damaged grouting and stained tiles (results of poor pH control and impaired water balance) should be dealt with.
- The standard of water clarity should be maintained [31] in such a way that the turbidity of water as expressed in Nephelometric Turbidity Units should not exceed 5; and the colour of water as expressed in Hazen Units or Pt-Co Colour Units should not exceed 5.
- Costume or towels supplied to all bathers should be disinfected, by immersion for not less than 30 seconds in boiling water [36] or laundering using hot water (70-80°C) and detergent. [32]

### II. Weekly cleansing routine

- Backwash of the filter on weekly basis or when it is triggered by a pressure drop.
- Clean pool wall, pool floor, handrails and stairs to remove bad marks.
- Clean the shower room with cleansing powder to remove accumulated dirt and soap.

## 6. Infection Control Measures in Special Facilities

- Check tiles for any defect.

### III. “When Necessary” cleansing routine

- Super chlorination (addition of an extra dose of chlorine to pool and staying overnight to achieve the Free Available Chlorine level to 6.0ppm) is recommended [33] every 2 to 4 weeks during regular usage if the pool would not be emptied for thorough cleansing routinely or when the amount of combined chlorine is deviated from standard value during routine daily test.
- After super chlorination, the pool can only be used until the chlorine residual drops below 3.0ppm. [33]

### 6.1.2 Pool Decontamination

#### I. Fecal materials found in pool

- The procedure depends on whether the stool is formed and can be removed intact. When it happens, close the pool, remove the stools, and raise the residue chlorine level to not less than 2 ppm for at least 1 hour with pH between 7.2 and 7.8 and wait for the chlorine level to resume normal before the pool is reopened for use. [43]
- If a loose stool is dispersed in the pool, raise the residue chlorine level up to 3 ppm for 53 hours and take water sample for testing the total bacterial count. Reopen the pool after passing the test. For small pools, drain away the pool water, completely disinfect the pool with diluted bleach (1 part of household bleach in 49 parts of water), refill water for circulation, take water sample for test and reopen the pool after receiving a satisfactory result. [43]
- As it is always difficult to differentiate between formed or loose stool in water, a more stringent measure should be taken, i.e., to treat it as loose stool, whenever in doubt. [33]

## 6. Infection Control Measures in Special Facilities

### II. Blood or Vomit

There is no well-documented evidence that the bloodborne pathogens, e.g. Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV) or Hepatitis C Virus (HCV), are likely to be transmitted to swimmers from a blood spill in a pool. However, pathogens such as noroviruses (Norwalk-like viruses) are likely to be spread by vomitus. The following procedures are recommended for disinfecting the pool after blood, body fluid or vomitus contamination [28]:

- The pool should be temporarily cleared and the contamination dispersed until there is no further trace.
- Wear appropriate PPE before cleaning up the spillage.
- For blood, it should not be washed into poolside drains.
- Cleanse the visible matters with disposable absorbent material.
- For blood spillage, mop the area with cloth or paper towels soaked with 1 in 4 diluted household bleach (5.25%) solution and leave for 10 minutes before rinsing with water; for body fluids or vomitus, mop the area with cloth or paper towels soaked with 1 in 49 diluted household bleach (5.25%) solution and leave for 15-30 minutes before rinsing with water.
- Test the disinfectant levels (i.e., Chlorine level) and water quality to ensure it is satisfactory before allowing people to swim.

# 6. Infection Control Measures in Special Facilities

## 6.1.3 Water Standards and Testing Frequency

To ensure a good and safe water quality in swimming pools and spa, the following water standard and test frequency should be observed:

<u>Pool standards</u>	<u>Parameter Range</u>	<u>Testing frequency</u>
Pool Water Temperature ( ° C)	26-28	Twice daily
Spa Water Temperature ( ° C) [34]	28-35	Twice daily
Room Temperature ( ° C) [34]	22-28	Once daily
Room Humidity (%) [34]]	50-75	Once daily
Free Chlorine (ppm) [35][44]	1.0-3.0	Hourly
Combined Chlorine (ppm) [35]	< 1	Hourly
pH [31][44]	7.2-7.8	Hourly
Clarity [31]	Floor markings on the pool bottom at its greatest depth can be clearly visible when looking from the side of the pool.	Once daily
Total colony-forming units /ml [31][44]	<200	Regularly and if necessary
E. coli, /100 ml [31] [44]	0	Regularly and if necessary

**Remarks:**

Owing to various methods of pool disinfection, filtration and construction, individual departments can follow their pool manufacturer's label directions or maintenance authority advice for the pool parameters, provided that the pool water is safe and hygienic.

## 6. Infection Control Measures in Special Facilities

### 6.1.4 Pool Maintenance

To ensure the proper function and acceptable water quality of swimming pools and whirlpools, qualified contractors should be commissioned to carry out maintenance work on pool backing, water treatment, filters, pumping and circulation systems regularly. Besides, the pool should be emptied at least annually, allowing a complete change of water and thorough inspection of the tiles, grouting and fittings. [33]

Frequency of every maintenance action is suggestive. The in-charge has to decide according to its local situation (e.g., pool users' load)

## 6.2 Fitness Centre or Gymnasium Room



The gymnasium environment and its equipments are commonly shared amongst people using the facilities, therefore, they are considered as frequently touched surfaces and common shared items. Inadequately cleaned equipment and reusable towels are the common breeding ground of bacteria, such as community associated methicillin resistant *Staphylococcus aureus* (CA-MRSA), gymnasium users may acquire CA-MRSA skin and soft tissues infection during contact sports or sharing of common equipment.

Respiratory hygiene and cough etiquette should be observed from time to time (please refer to section 3.3.1 II for details). Daily cleaning of the gymnasium environment and its equipment, together with keeping good personal hygiene, are very important to provide a clean environment for both the gymnasium users, as well as the staff.

## 6. Infection Control Measures in Special Facilities

### 6.2.1 Environmental cleansing:

- General facilities and areas of the fitness centre should be washed with a 1 in 99 diluted household bleach (5.25%) solution and wiped at least once daily.
- The frequency of cleaning should be stepped up if the facilities become dirty.
- To facilitate frequent cleaning, adequate disinfectant (such as 70% alcohol) and paper towels should be made readily accessible for gymnasium users and staff.
- All towels and clothing provided by the gymnasium or fitness centre should be laundered using hot water (70-80°C) cycle between use. [32]
- Receptacles with a lid should be readily available for the disposal of used paper towels.
- Handwashing facilities and 70% alcohol handrub should be provided for the gymnasium user and staff to wash their hands after cleaning or wiping down equipment.

### 6.2.2 Personal hygiene for users

- Disinfect any broken skin such as cuts or abrasions immediately and cover properly with waterproof adhesive dressing.
- Avoid participation in any activities in the gymnasium or fitness centre if the draining wounds cannot be securely covered by dressing materials.
- Do not share personal items such as towels, clothing, or water bottles.
- Keeping feet dry, frequent changes of absorbent socks, and adequate drying of shoes between uses.
- Keep fingernails short.
- Keep hands clean at all time.

## 6. Infection Control Measures in Special Facilities

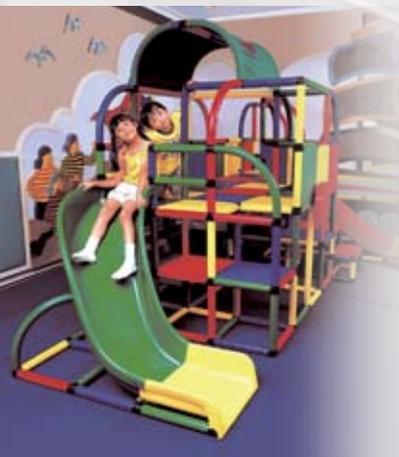
- Perform hand hygiene as necessary: before eating and touching nose, mouth or eyes; after going to toilet, touching public installations or equipment; and after the work-out session.
- Rub hands with a disinfectant containing 70-80% alcohol if hands are not visibly soiled and liquid soap and water are not available.
- Consider to stop working out at the fitness centre and seek medical advice if you have respiratory symptoms such as fever, cough, sore throat, runny nose, shortness of breath or breathing difficulties.

### 6.3 Child Care Facilities

Infants and toddlers are highly susceptible to contagious diseases and therefore keeping the child care environment clean and orderly is very important for health and safety of both children and service providers. Routine cleaning with detergent and water is sufficient for removing pathogens from surfaces in child care facilities. However, some items and surfaces such as diaper changing area, toileting area or toys should be disinfected regularly. [17, 21, 26]

#### 6.3.1 Diapering

- The diaper changing area or furniture that may come to contact with faeces or urine should be cleaned and disinfected after each diaper change or decontaminated promptly when they are visibly soiled. [17, 20-21, 23, 25-26]
- Tables or counter surfaces used for diapering should be made of smooth, non-absorbent, non-porous materials or a washable pad cover. It should be easily cleaned and free of any cracks. [17, 21, 25-26]



## 6. Infection Control Measures in Special Facilities

- Hand hygiene facilities should be located in close proximity of the diapering area. [17, 21, 25]
- Soiled diapers should be disposed properly in a lidded waste container.
- Hand hygiene should be performed immediately after each diaper change. [17, 21, 25-26]
- For soiled cloth diapers or clothing [17, 25], empty faecal contents into the toilet and place in a leak resistant bag. Do not wash or rinse diapers or clothes soiled with faecal materials in child care facility as it increases the risk of splashing, contamination of hands and environmental surfaces.
- Disposable towels should be used on top of the mat, and they should be changed between each diaper change. [17, 20]
- Diaper changing area should not be used for food service or storage, and play area. [21, 25]
- Any episodes of diarrhea discovered when changing a diaper, the child should be separated from other children and kept out from the child care facilities, as possible. [20, 25]

### 6.3.2 Furnishings

- All furnishings in the child care centre should be washed or cleaned at least daily and steam-cleaned periodically. [17, 21]
- Furnishings and high-touched surfaces should be cleaned and disinfected regularly or the frequency of cleaning and disinfection should be increased as the circumstances require. [27-28]
- Surfaces contaminated with body fluid should be disinfected immediately with 1 in 49 diluted household bleach (5.25%) solution, leave for 15-30 minutes, and then rinsed with water and dried. [28]

## 6. Infection Control Measures in Special Facilities

- The schedule of cleaning, operation manual and training should be established and followed. [27]

### 6.3.3 Toileting Area

- Hand washing facilities should be made convenient in toilet area. Toilet adapters or step stools that help children to flush toilets are preferred. [21, 25]
- Potty should be emptied immediately after use. They should be cleaned and disinfected at least daily or when it should visibly soiled with urine or faeces. [17, 21, 25]
- Potty chairs should not be rinsed in a sink used for hand washing. [17]
- No toy is allowed to be taken to the toilet area. [21]

### 6.3.4 Toys and Ball Pool

- Toys with suitable materials that can be easily cleaned and disinfected should be selected. [18, 21, 24, 26]
- Toys made of strong absorbents materials, such as wool or stuffed furry toys, should not be used if they will be shared. [17-18, 27]
- Large stationary toys such as climbing equipment should be cleaned and disinfected at least weekly and whenever visibly soiled. [18, 26]
- If toys are likely to be mouthed, it should be rinsed with water after disinfection between uses by individual children, or it should be alternatively washed in a dishwasher. [17-18]
- Toys and equipments such as blocks or trucks that are not put into mouths should be cleaned at least daily or when obviously soiled. [17, 26]

## 6. Infection Control Measures in Special Facilities

- Hard or plastic toys should be cleaned regularly e.g. daily by washing with water and detergent, followed by thorough rinsing and drying. [17, 21, 26]
- Soft or cloth toys should be washed daily in the hot water cycle of washing machine, taking care to follow the manufacturers washing instructions. [17, 21, 26]
- If toys are required for cleaning and disinfection, do so immediately or they should be stored in a designated labeled container separated from the toys that are clean and ready for use. [18]
- Toys should be decontaminated immediately when it is visibly soiled or contaminated. [21, 26]
- Hard and plastic toys should be disinfected with 1 in 49 diluted household bleach solution, then rinsed with water and let it dry. [21, 26]
- 70% alcohol solution could be used on the metal surface of any toys
- Soft or stuffed toys could be cleaned by laundering process in a hot water wash (at least 60°C) of washing machine. Heavily contaminated toys may have to be discarded. [17, 21, 26]
- Hand hygiene of the children is recommended after handling contaminated toys or after playing in the ball pool. [21, 26]

### 6.3.5 Management guidance for gastroenteritis outbreak

- Sick children or those who present gastroenteritis symptoms should be excluded from child care facility. Prompt medical treatment should be arranged. [17, 20, 23, 25, 27]
- Group activities should be suspended during the period of outbreak. [17, 21, 25]

## 6. Infection Control Measures in Special Facilities

- Environmental surface such as toilet seats, flush handles or door handles should be cleaned and disinfected with 1 in 49 diluted household bleach (5.25%) solution regularly or if situation allows and requires, the frequency of cleaning and disinfection could be increased. [17, 21, 23, 25, 27]
- 70% alcohol should be used for disinfecting metal surfaces, if required. [25, 27]
- If spillage occurs (please refer to section 5.2.2 for details of spillage handling), it should be decontaminated promptly.
- Procedures for cleaning and disinfecting toys should be strictly followed. [17, 21]
- Soft or stuffed toys should not be used during the period of outbreak. [21]
- Other toys should be washed and disinfected at least daily. Stock rotation should occur to limit the number of toys accessible at once. [21]
- Ensure practice of good hand hygiene and diapering changing in all children and care providers. [17, 21, 27]

### 6.4 Sauna, Massage and Beauty Centre

As general good practices, sufficient dressing rooms, shower rooms, toilet facilities and separate locker for the guests are recommended to promote the personal hygiene. Adequate handwashing facilities including handwashing basin, liquid soap and paper towels/hand dryer should be provided to facilitate handwashing for the users. Adequate showering facilities and toiletries including bathing liquid soap and shampoo should be provided for the convenience of the guests using the facilities. [37, 41, 42] Hand hygiene (please refer to section 3.3.1 I for details) as well as respiratory hygiene (please refer to section 3.3.1 II for details) should be observed from time to time.

## 6. Infection Control Measures in Special Facilities

Having a shower before entering and using of the facilities is recommended. [38] Towels provided for the guests should be laundered using hot water (70-80°C) cycle between use. [32] A covered receptacle should be provided exclusively for soiled linens and towels which can be readily emptied and cleaned. [37, 41, 42]

Guests with signs and symptoms of communicable diseases, such as skin lesions, respiratory illness or diarrhea should be prohibited from the use of the facilities. [37, 41]

### 6.4.1 Environmental cleansing

#### I. Sauna

- Sweeping or vacuuming the sauna room should be performed after each session to keep it free from dust and hair. [37]
- The environmental surface, especially the bench top, should be disinfected with 1 in 99 diluted household bleach (5.25%) solution after each session, then rinsed with water and wiped dry.
- If floor is covered with ceramic tile, all the duckboards should be removed and disinfected with 1 in 99 diluted household bleach (5.25%) solution after each session, then rinsed with water and wiped dry. Before replacing back the duckboards to the original position, the floor underneath should also be cleaned with detergent, rinsed well and wiped dry at least daily.
- If bleach is used, cleaning and disinfection should be done at room temperature and under good ventilation. The surfaces should be thoroughly rinsed with water before subsequent session. [38]



#### II. Massage & beauty centre

- Separate massage room for each patron if possible. [42]

## 6. Infection Control Measures in Special Facilities



- All walls, ceilings, floors should be in good repair and maintained in a clean and sanitary condition. It should be cleaned at least twice each day. [42]
- The surface of massage couch should be made of durable washable plastic or other waterproof material which is easy for cleaning, disinfecting and maintenance.
- It should be disinfected with 1 in 99 diluted household bleach (5.25%) solution then rinsed with water and wiped dry after each use. It should be checked for any defect regularly.
- Written record of cleaning and disinfecting schedule should be established and maintained. [42]

### 6.4.2 Specific requirement and practice

#### I. Sauna



- Wooden benches should be painted with a waterproof paint to seal and smooth the surface, facilitate drying, and reduce areas where bacteria may grow.[38]
- Stainless steel surface of the electric sauna heater should be wiped with mild detergent and soft cloth at least daily. It should then be rinsed with water afterwards.
- Sauna stones can be washed with soapy water and rinsed with plain water. It should be inspected from time to time to make sure their integrity and cleanliness. It should be changed if cracked or they are giving off a bad odor.
- Clients should be encouraged to use a clean towel or clothing to act as a barrier between the benches and bare skin.[32, 38, 39]
- Maintenance check should be done yearly or as suggested by the manufacturer for the sauna facilities.

## 6. Infection Control Measures in Special Facilities

### II. Massage and beauty centre

- All towels or linen should undergo proper laundering process after each use. [32, 37, 41, 42]
- Single-use paper coverings should be discarded into a sanitary receptacle after use. [42]
- All instruments should be kept clean, in good repair, and capable of being disinfected and/or sanitized. For example, hot stones used for massage should be disinfected after each use. Disposable instruments should be used when available. [37, 41, 42]
- If clothing is provided for the guests, it should undergo proper laundering process after each use. [32, 37, 42] If underwear is provided, it should be disposable and for single use only. [42]
- To avoid contamination, staff should ensure any make-up, cream, ointment, massage oil or similar substance is removed from its original container / tube using a clean disposable applicator. Applicators used for dispensing must not be re-dipped into the original container and must be discarded after each client. Single use applicators are recommended. [39]
- Leftover portion for dispensing should not be returned to the original container and must not be used on other clients. [39]
- Pump outlets, bottles and nozzles for dispensing are a potential source of contamination, particularly due to the contents accumulated around the outlet. Nozzles should be cleaned frequently and dried before replaced. Wash bottles and nozzles in warm water and detergent, rinse them under hot running water, and dry them using a lint-free cloth, before refilling the bottle or replacing the pump / spray nozzle. Pump / spray bottles should never be topped up. [39]



## 6. Infection Control Measures in Special Facilities

### 6.4.3 Personal hygiene of health of masseur / masseuse

- Masseur / masseuse should maintain good personal hygiene, such as executing proper hand hygiene, [37, 39] keeping nail short and clean. No artificial nails, such as acrylic nails, accessories, such as watch or ring, is allowed on providing massage service.
- Masseur / masseuse should wear clean outer garments / uniform when serving a patron. [41, 42]
- Masseur / masseuse should be refrained from work if they have active skin lesion, nail infection or any signs and symptoms of infectious disease, such as fever, sore throat or cough. [37]

### 6.4.4 Public showering facilities

- Materials such as the large tiles are recommended for ease of maintenance. It should be checked for any defect regularly.
- The shower room surface should be cleaned frequently with detergent and water, or it should be disinfected regularly with 1 in 99 diluted household bleach (5.25%) solution, then rinsed with water and wiped dry, if necessary.
- Grab bars and showerheads should be cleaned frequently as these are the commonly touched area.
- Floor should be kept dry after cleaning.
- Handwashing facilities, including handwashing basin, liquid soap and paper towels or hand dryer, should be provided. [37]
- Ensure adequate toiletries, such as bathing liquid soap & shampoo are provided. [37]
- Towels provided for the guests should be laundered using hot water (70-80°C) cycle between use. [32]



## 6. Infection Control Measures in Special Facilities

- A covered receptacle which can be readily emptied and cleaned should be provided exclusively for the soiled linens and towels. [37]
- The guests should be recommended to avoid walking with bare foot in the shower room. [38]
- About half a litre of water should be poured into each drain outlet regularly (e.g. once a week) so as to maintain the water column in the pipe to serve as water lock. [40]
- Ensure the drain pipes are built with U-shaped water traps; the pipelines should never be altered without authorization. [40]
- Ensure the soil pipes are unobstructed and the sewage drains are functioning properly without leakage so as to avoid breeding of infective agents. [40]
- The ventilation system should be maintained to provide a well-ventilated environment. The exhaust fan should be cleaned regularly.



### 6.5 Catering Services

To safeguard the health of guests and to ensure the satisfactory standards are reached, guidelines and instructions on food safety and food premises hygiene issued by the Food and Environmental Hygiene Department (FEHD) should be complied from time to time. Hotel management should also promote food safety and hygiene by providing relevant trainings to food handlers and supervisors regularly.

The following advices should not be taken in any way as a substitute for the regulations issued by the FEHD. Please refer to the most updated guidelines and information posted on the FEHD's website at <http://www.fehd.gov.hk> for details.

## 6. Infection Control Measures in Special Facilities

### 6.5.1 Personal hygiene of food handlers

- Keep all parts of bodies, clothing, hands and nails clean at all times. Nails should be kept short and unpolished. Cover wounds on hands completely by suitable waterproof dressings.
- Perform proper hand hygiene frequently and as required. Wear mask when handling food and disposable gloves especially when handling ready-to-eat food.
- Refrain from smoking, spitting, chewing, eating, sneezing or coughing over unprotected food or food contact surface, touching ready-to-eat food with bare hands, sitting, lying or standing on any surface liable to come into contact with food, tasting food with fingers, touching hair or other parts of bodies when inside food preparation areas as that may result in contamination of food.
- Food handlers suffering or suspected to be suffering from a communicable disease should immediately report their illness to the management and seek medical treatment. They should be immediately suspended from engaging in any work that may allow them to come into contact with food, food contact surfaces, food utensils and equipment.



### 6.5.2 Food Hygiene

- Food should be supplied from approved and reputable sources and promptly identified and moved to proper storage areas upon receipt to facilitate tracing products in the event of a recall or food incident,
- Food and raw materials should be stored off the floor and first-in-first-out principle for food storage should be applied to minimize the growth of microorganisms and to prevent food from becoming unsafe or unsuitable during their expected shelf-lives.

## 6. Infection Control Measures in Special Facilities

- Ensure food be kept at proper temperature during cooling, storage, display and transportation to suppress bacteria from multiplying to an unsafe level in the food. The temperature inside the refrigerator should be kept at or below 4°C and the freezer at or below -18°C. The temperature inside the refrigerator should be monitored regularly.
- Frozen food should be thawed properly and completely to minimize the growth of food poisoning bacteria and toxin production.
- Prevent cross-contamination between raw and cooked or read-to-eat food by separate handling (e.g. using separate knives and chopping boards) and storage. Food should also be properly protected during storage, preparation, display, service and transportation to prevent contamination by equipment, utensils and personnel as the transfer of bacteria from one food (usually raw) to another is one of the major causes of foodborne illnesses.
- Cook food thoroughly before consumption in order to ensure food safety. The centre or the thickest part of the food needs to reach 75°C for 15 seconds to kill any bacteria causing foodborne diseases, although heating food to a lower temperature for longer periods of time may be equally effective.
- Food that previously cooked and cooled be reheated thoroughly before consumption to minimize the time that cooked food is exposed to the temperature danger zone (between 4°C and 60°C) which allows pathogenic bacteria to grow during the reheating process.

## 6. Infection Control Measures in Special Facilities

### 6.5.3 Premises Hygiene

- Ensure walls, floors and ceilings are properly maintained and kept clean, sewerage / grease trap, plumbing system and extraction / exhaust systems in food room are in good working condition and grease filters installed and kept clean so as to protect food from contamination.
- Ensure ventilating system in premises is functioning properly to safeguard the health of customers and workers.
- Toilets should be kept clean and free from obstruction. Water closets should be in good working condition and wash hand basins should be adequate, kept clean and provided with liquid soap and hand-drying facilities to facilitate frequent handwashing of food handlers.
- Ensure adequate waste containers, properly covered and emptied daily.
- Prevent pest infestation - proper storage of food, proper disposal of rubbish, be aware of signs of pest infestation and arrange for pest disinfestations where necessary.
- Prohibit dogs, cats, birds or pets in food rooms.
- Ensure no deviation from approved layout.

### 6.5.4 Utensils and equipment

- Food contact surfaces of equipment and utensils should be properly maintained, kept clean and sanitized between uses.
- Non-food contact surfaces of equipment should be properly maintained and kept clean.
- Cleaned equipment and utensils should be properly stored.

# 7. Appendix

## Appendix A: Hand Hygiene Technique

# Hand Hygiene Technique



## 7. Appendix

### Appendix B: Notification of Infectious Diseases

In accordance with the Prevention and Control of Disease Ordinance (Cap.599), all registered medical practitioners are required to notify the Centre for Health Protection all suspected or confirmed cases of these diseases.

For the most updated list of statutory notifiable diseases, please refer to the CENO website ([https://cdis.chp.gov.hk/CDIS\\_CENO\\_ONLINE/disease.html](https://cdis.chp.gov.hk/CDIS_CENO_ONLINE/disease.html)).

# 7. Appendix

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# 7. Appendix

## Appendix C: Commonly Used of Disinfectants

Name	Concentration	Usage	Properties
Sodium Hypochlorites	1% (10,000 ppm) Dilution ratio 1 :5* 0. 1% (1, 000 ppm) Dilution ratio 1 :50* * Preparation of Diluted should be according to the information sheet of "Preparation of Bleach"	Environmental or equipment disinfection	Mixes with water Corrosive to metals Avoid contact with skin or mucous membrane Contact with acids liberates toxic gas Diluted solution decompose rapidly Freshly prepared diluted bleach should be used within 24 hours
Alcohols: e.g. - Ethyl Alcohol - Isopropyl Alcohol	70%	Skin or metal surface disinfection instrumental disinfection	Inflammable liquid Rapid action but volatile Poor penetration into organic matter
Diguan ides : e.g. - Chlorhexidine : Hibitane	aqueous 1:1000	Skin and mucous membrane disinfection Wound dressing	Solution Low toxicity
- Chlorhexidine + cetrimide/ cetavlon e. g. Savlon	aqueous 1:100		Solution Low toxicity Detergent properties

## 7. Appendix

### Appendix D: The Use of Bleach

#### The Use of Bleach

Bleach is a strong and effective disinfectant. Its active ingredient, sodium hypochlorite, denatures protein in micro-organisms and is therefore effective in killing bacteria, fungus and viruses. Household bleach works quickly and is widely available at a low cost. Diluted household bleach is thus recommended for the disinfection of facilities.

As bleach irritates mucous membranes, the skin and the airway, decomposes under heat or light and reacts readily with other chemicals, caution should be exercised in the use of it. Improper use of bleach may reduce its effectiveness in disinfection and also lead to accidents which can be harmful to health. Overuse of bleach or using a bleach solution that is too concentrated results in the production of toxic substances that pollute the environment and disturb ecological balance.

#### Tools and Equipment

Before cleaning, get all necessary tools and equipment ready. Cleaning tools, cleansers/disinfectants, measuring tools and protective gear will be needed.

Cleaning tools:

Brush, mop, towel, spray can and bucket.

Cleansers/disinfectants:

Bleach and water.

Measuring tools:

Tablespoon and measuring cup.

Protective gear:

Mask, rubber gloves, plastic apron and goggles (recommended).

## 7. Appendix

### Procedures of Preparing / Using Diluted Bleach

1. Keep windows open when diluting or using bleach to ensure good ventilation.
2. Put on protective gear when diluting or using bleach as it irritates mucous membranes, the skin and the airway.
3. Cold water should be used for dilution as hot water decomposes the active ingredient of bleach and renders it ineffective.
4. Bleach containing 5.25% sodium hypochlorite should be diluted as follows:
  - 1 in 99 diluted household bleach (mixing 10ml of bleach with 990ml of water) can be used for general household cleaning.
  - 1 in 49 diluted household bleach (mixing 10ml of bleach with 490ml of water) is used to
  - disinfect surfaces or articles contaminated with vomitus, excreta and secretions.
5. Make adjustments to the amount of bleach added if its concentration of sodium hypochlorite is above or below 5.25%.
6. For accurate measurement of the amount of bleach added, a tablespoon or measuring cup can be used.
7. Rinse disinfected articles with water and wipe dry.
8. Cleaning tools should be soaked in diluted bleach for 30 minutes and then rinsed thoroughly before reuse.
9. Finally, wash hands with liquid soap, then dry hands with a clean towel or disposable towel.
  - Calculation: Multiplier of the amount of bleach added =  $\frac{5.25}{\text{concentration of sodium hypochlorite in bleach}}$
  - For example, when diluting a bleach containing only 5% sodium hypochlorite, the multiplier is  $\frac{5.25}{5} = 1.05$ . That means  $10 \times 1.05 = 10.5$ ml of bleach should be used when preparing a bleach solution.

## 7. Appendix

### Precautions

- Avoid using bleach on metals, wool, nylon, silk, dyed fabric and painted surfaces.
- Avoid touching the eyes. If bleach gets into the eyes, immediately rinse with water for at least 15 minutes and consult a doctor.
- Bleach should not be used together or mixed with other household detergents as this reduces its effectiveness in disinfection and causes chemical reactions. For instance, a toxic gas is produced when bleach is mixed with acidic detergents such as those used for toilet cleaning. This could result in accidents and injuries. If necessary, use detergents first and rinse thoroughly with water before using bleach for disinfection.
- As undiluted bleach liberates a toxic gas when exposed to sunlight, it should be stored in a cool and shaded place out of reach of children.
- Sodium hypochlorite decomposes with time. To ensure its effectiveness, it is advised to purchase recently produced bleach and avoid over-stocking.
- For effective disinfection, diluted bleach should be used within 24 hours after preparation as decomposition increases with time if left unused.

November 2007 (revised)

# 7. Appendix

## Appendix E: Maintain Cough Manners

### 咳嗽要講禮 Maintain Cough Manners



#### 遮掩口鼻有禮

打噴嚏或咳嗽時要掩着口和鼻  
Cover nose and mouth  
while sneezing or coughing



#### 正確棄置有禮

呼嚥過分泌物應用紙巾包好，  
並棄置於有蓋垃圾桶內  
Dispose of soiled tissue paper  
properly in a lidded rubbish bin



#### 潔淨雙手有禮

打噴嚏或咳嗽後應徹底洗手  
Wash hands thoroughly  
after sneezing or coughing



#### 佩戴口罩有禮

如有呼吸系統感染，應佩戴口罩  
Put on a surgical mask while  
having a respiratory infection



[www.chp.gov.hk](http://www.chp.gov.hk)

# 7. Appendix

## Appendix F: Sequence of Donning & Removing Personal Protective Equipment (PPE)

### Donning PPE



1  
Perform  
Hand Hygiene



3  
Put on  
Eye Protection &  
Disposable cap



2  
Put on Mask /  
N95 Respirator  
(Perform Seal Check)



4  
Put on  
Gown



5  
Put on  
Gloves

### Removing PPE



1  
Remove  
Gloves



2  
Perform  
Hand Hygiene



3  
Remove Gown  
(Folding inside out)



4  
Perform  
Hand Hygiene



5  
Remove Cap &  
Eye protection



6  
Perform Hand  
Hygiene (Optional)



7  
Remove  
Mask /  
N95 Respirator



8  
Perform Hand  
Hygiene **AGAIN**

# 7. Appendix

## Appendix G: Useful links

Department of Health	<a href="http://www.dh.gov.hk">http:// www.dh.gov.hk</a>
- Centre for Health Protection	<a href="http://www.chp.gov.hk">http://www.chp.gov.hk</a>
- Central Notification Office (CENO)	<a href="http://www.chp.gov.hk/ceno">http://www.chp.gov.hk/ceno</a>
- Travel Health Service	<a href="http://www.travelhealth.gov.hk/">http://www.travelhealth.gov.hk/</a>
- Central Health Education Unit	<a href="http://www.cheu.gov.hk">http://www.cheu.gov.hk</a>
Food and Environmental Hygiene Department	<a href="http://www.fehd.gov.hk">http://www.fehd.gov.hk</a>
Center for Disease Control and Prevention	<a href="http://www.cdc.gov">http://www.cdc.gov</a>
World Health Organization	<a href="http://www.who.int">http://www.who.int</a>



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