THE NATIONAL INFECTION PREVENTION AND CONTROL GUIDELINES FOR COMMUNITY HOSPITALS

2021

FOREWORD

The National Infection Prevention and Control Committee (NIPC) was appointed by the Singapore Ministry of Health in 2014 and charged with several tasks including consolidation of national guidelines to support healthcare facilities in developing policies to meet national standards.

It is with pleasure that we present this first edition of '*National Infection Prevention and Control Guidelines for Community Hospitals*'. This guideline aims to address prevention strategies at the community hospital setting where transitional care support is given with major goal of maintaining and supporting independence and community living. The risk for healthcare associated infections may be lower than that of an acute care setting but attention should be paid especially to the care of devices. This set of guidelines was designed for use by those responsible for infection prevention in the community hospitals e.g. infection preventionist, nurse manager, nurse.

The recommendations in these guidelines were developed by reviewing best available evidence and consulting with specialists in the field. We welcome any feedback that will help improve the guideline moving forward through our secretariat at NIPC_Sec@moh.gov.sg.

This document was finalized during the COVID-19 Pandemic giving us the opportunity to include some relevant and specific IPC interventions as communicated by MOH and NIPC during the outbreak. To remain current and necessarily adapted however COVID-19 specific detail is better obtained from periodic memoranda and guidance rather than this document. During the COVID-19 pandemic however each chapter of this guidance warrants specific consideration for the special context. All HCFs should ensure good implementation of official guidance as it evolves.

Yours sincerely,
Prof Dale Fisher
Chairperson
National Infection Prevention and Control Committee (NIPC)

ACKNOWLEDGEMENT

The National Infection Prevention and Control (IPC) Guidelines for Community Hospitals 2021 has been formulated under the National Infection Prevention and Control (NIPC) Committee (Table 0.1). There has been extensive discussion and collaboration with Singapore's experts in IPC based clinically in acute healthcare facilities, community hospitals and Ministry of Health (MOH). Worth of mention is the guidelines drafting workgroup of experts led by Dr Kala Kanagasabai (Table 0.2).

Table 0.1: Composition of NIPC

S/N	Name	Role	Designation
1	Prof Dale Fisher (Chairperson)	Chairperson	Senior Consultant, Division of Infectious Diseases, University Medicine Cluster, NUH
2	Adj A/Prof Brenda Ang	Member	Clinical Director, Department of Infection Prevention and Control, TTSH
3	Ms Foo Meow Ling	Member	Senior Nurse Clinician, Department of Nursing, KTPH
4	Dr Kala Kanagasabai	Member	Senior Consultant, Director, Clinical Quality, Ren Ci Hospital
5	A/Prof Ling Moi Lin	Member	Director, Infection Prevention and Epidemiology, SGH
6	Adj Asst Prof Kalisvar Marimuthu	Member	Clinical director, Infection Prevention and Control Office, Woodlands Health Campus (WHC)
7	Adj Asst Prof Surinder Pada	Member	Director and Senior Consultant, Infectious Diseases, NTFGH
8	A/Prof Thoon Koh Cheng	Member	Head and Senior consultant, Infectious Disease Service and Infection Control Committee Chair, KKH
MOH Representatives and NIPC Secretariats			
9	Dr Kok Mun Foong	MOH Representative	Director, Patient Safety and Quality Improvement Branch, Clinical Quality, Performance and Value Division, MOH
10	Dr Adelina Young	MOH Representative	Deputy Director, Patient Safety and Quality Improvement Branch, Clinical Quality, Performance and Value Division, MOH
11	Ms Luisa Tan	Secretariat	Assistant Director, Patient Safety and Quality Improvement Branch, Clinical Quality, Performance and Value Division, MOH
12	Ms Ong Xin Yi	Secretariat	Senior Manager, Patient Safety and Quality Improvement Branch, Clinical Quality, Performance and Value Division, MOH

Table 0.2: Experts who contributed to the drafting of the guidelines (in alphabetical order)

S/N	Name	Designation
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2	Mr Min Min Aung	Assistant Manager, Clinical Quality Management Unit, Ren Ci Hospital
3	Ms Nurul Ain Abdul Latiff	Quality Executive, Clinical Quality Management Unit, Ren Ci Hospital
4	Dr Chuah Taik Pin	Head, Clinical Quality, Jurong Community Hospital
5	Mr Chin Yong Kang Gabriel	Staff Nurse, Infection Control, St Andrew's Community Hospital
6	Dr Edward Goh	Consultant, Infection Control, St Andrew's Community Hospital
7	Ms Gao Ting	Director, Clinical Governance, Seng Kang Community Hospital
8	Ms Habibah Ab Samat	Senior Staff Nurse, Nursing Administration, Jurong Community Hospital
9	Dr Kala Kanagasabai	Director, Clinical Quality Management Unit, Ren Ci Hospital
10	Dr Jocelyn Koh	Director, Medical Services, Ang Mo Kio-Thye Hua Kwan Hospital
11	Mr Ivan Koh Yingren	Assistant Nurse Clinician, Infection Control, Ang Mo Kio-Thye Hua Kwan Hospital
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14	Mr Benjamin Tan	Assistant Nurse Clinician, Infection Control, Yishun Community Hospital
15	Dr Colin Ngeow	Consultant, Medical Services, Yishun Community Hospital
16	Ms Rodona Labuanan	Senior Nurse Manager, Infection Control, Bright Vision Hospital
17	Dr Soh Ling Ling	Senior Staff Registrar, Post-Acute and Continuing Care Service, Seng Kang Community Hospital
18	Ms Toh Cheng Yen	Senior Nurse Manager, Nursing, Ren Ci Hospital
19	Ms Zuraidah Bte Sulaiman	Nurse Clinician, Nursing, Ren Ci Hospital

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In order of appearance:

ABBREVIATIONS AND GLOSSARY

ABHR	Alcohol-Base Hand Rubs
APSIC	Asia Pacific Society of Infection Control
CAUTI	Catheter Associated Urinary Tract Infection
CD Toxin	Clostridium Difficile Toxin
CH	Community Hospital
CPO	Carbapenemase-Producing Organisms
CRE	Carbapenem-Resistant *Enterobacteriaceae*
DORSCON	Disease Outbreak Response System Condition
HAI	Healthcare associated infections
HAP	Healthcare Associated Pneumonia
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HCW	Healthcare workers
HCP	Healthcare Professionals
HEPA	High Efficiency Particulate Air
HIV	Human Immunodeficiency Virus
HSCT	Hematopoietic Stem Cell Transplant
ICN	Infection Control Nurse
ILTC	Integrated Long Term Care Facility
IPC	Infection Prevention and Control
MDRO	Multi-Drug Resistant Organism
MOH	Ministry of Health
MMR	Measles, mumps, rubella

MRSA	Methicillin-resistant *Staphylococcus aureus*
NaDCC	Sodium Dichloroisocyanurate
PEP	Post exposure prophylaxis
PPE	Personal Protective Equipment
PPM	Parts Per Million
TB	Tuberculosis
UTI	Urinary Tract Infection
VISA	Vancomycin Intermediate *Staphylococcus aureus*
VRSA	Vancomycin Resistant *Staphylococcus aureus*
VRE	Vancomycin-Resistant *Enterococcus*
WHO	World Health Organization

CHAPTER 1 GOVERNANCE AND MANAGEMENT

1.1 Introduction

An infection prevention and control (IPC) programme is required to manage and plan strategically preventive measures for the community hospital. An IPC committee comprising stakeholders and partners across the hospital should be appointed with the following terms of reference:

1. Annual goal-setting and strategic planning for the IPC programme and the IPC Committee
2. Ensuring that the IPC programme meets current national standards and requirements as well as the requirements of the organisation
3. Advocating for resources necessary to accomplish the goals of the programme
4. Acting in an expert advisory capacity on controversial issues
5. Reviewing patient safety/risk management/quality improvement initiatives related to HAIs
6. IPC programme evaluation

An IPC team comprising a doctor and a trained Infection Control Professional (ICP) is responsible for the implementation and execution of the IPC programme in the hospital. A minimum ratio of 1.0 full-time equivalent (FTE) ICP per 200 beds is recommended. This is a necessary dedicated position to ensure success in the IPC programme. The IPC team should report to the Medical director or equiivalent of the Community Hospital, who ultimately oversees their initiatives. Champions or IPC liaison staff may be appointed to assist the team in implementing the IPC programme.

1.2 Emergency Response / Contingency Plans

This refers to contingency plans in the event of a pandemic as announced by WHO or MOH. Please refer to national DORSCON plans in MOH website for latest updates (https://www.moh.gov.sg/diseases-updates/being-prepared-for-a-pandemic).

The community hospital IPC team is to help develop policies and procedures to equip staff with appropriate use of PPE in moments of crisis. IPC education plan should factor this in as part of the mandatory competency expected of each staff. Drills or exercises should be conducted regularly to test the feasibility of plans set up and its efficiency in operation.

1.3 Recommendations

1. Strategic annual goals are set outlining the IPC programme and budget is allocated for relevant resources required.
2. The IPC programme is managed by the IPC team comprising the IPC doctor and IPC practitioner/s.
3. The multidisciplinary IPC Committee reporting to the Director supports the IPC programme.
4. Emergency preparedness plan should be part of the IPC programme to help the hospital to be ready for pandemics.
5. During a pandemic, the IPC team will advise on issues as a member of the Disease Outbreak Task Force.

1.4 References

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CHAPTER 2 HUMAN RESOURCE MANAGEMENT

2.1 Introduction

It is an expectation that staff and service providers have the knowledge, skills and training required to consistently implement effective IPC practices, as appropriate. The training programme should include:

- Hand hygiene
- Concepts of Standard and Transmission-based Precautions
- Appropriate use of personal protective equipment (PPE)
- Safe management of sharps
- Staff immunisation
- Environment hygiene
- Disinfection and sterilisation
- How and when to report IPC-related incidents, injuries and issues of concern.

Patients and families should also receive education on basic hygiene, transmission precautions and hand hygiene during routine care. If possible, patient and family education practices should be incorporated in the orientation programme.

Continuing professional development and learning for IPC team is supported by the organisation. Education and training for these include:

- Basic IPC training from a recognised course (e.g. APSIC)
- Ongoing development of IPC team's own knowledge, skills and practice through formal continuing education, attendance at professional meetings, workshops and seminars
- Development of communication skills
- Access to current IPC literature, textbooks, journals including online
- Networking resources and opportunities with peers in the IPC field.

2.2 Staff Vaccination

Healthcare personnel (HCP) work in an environment where they are routinely at risk of being in contact with infected patients or infective materials. This includes risk of exposure to vaccine–preventable diseases and possible transmission of infectious agents to patients, their families and other HCPs. This risk can be significantly reduced with a combination of good infection prevention practices and vaccinations.

HCPs include (but are not limited to) doctors, nurses, dental personnel, medical, nursing and dental students, laboratory technicians, pharmacists, physiotherapists, occupational and speech therapists, medical social workers, radiographers and hospital volunteers, environmental services staff, catering staff, ambulance staff, patient-facing counter staff, whether employed directly or through contract. The benefits of vaccination in healthcare settings, have shown in different studies where high vaccination coverage among HCPs reduces the risk of outbreaks and disease transmission.

In Dec 2014, Ministry of Health released a circular on Immunisation of Healthcare Workers – updated recommendations (MOH circular no. 45/2014). This was updated on 10 Sep 2018 (MOH circular no. 41/2018) to include immunity against tetanus, diphtheria, pertussis and hepatitis B for all healthcare workers. Institutions should refer to the relevant prevailing circulars for recommendations on immunisation of healthcare workers.

2.3 Recommendations

1. IPC education shall meet the IPC programme priorities of the community hospital.
2. There shall be an orientation programme provided to new staff, service providers and volunteers.
3. IPC education shall be regularly evaluated, and education programme revised accordingly.
4. The community hospital shall support the professional development and provide resources for continual learning for the IPC team.
5. The community hospital shall communicate relevant information about minimizing infection risks to patients, caregivers and visitors.
6. Resources are in place to protect HCPs from infectious diseases (e.g. PPE, easily accessed hand hygiene, immunisation programme, and injection safety initiatives).

7. The community hospital is to provide counseling, follow-up and work restriction recommendations for IPC-related injuries resulting in exposure to infectious agents.
8. During a pandemic, staff training and competency in use of appropriate PPE is to be reviewed and confirmed especially for those working in the hot zones.

2.4 References

The National Infection Prevention and Control Guidelines for Acute Healthcare Facilities (2017)

CHAPTER 3 IPC PROGRAMME

3.1 Introduction

At a minimum, the IPC programme will have the following policies and procedures:

- Hand hygiene
- Standard and Transmission-based Precautions
- Aseptic technique when performing invasive procedures and handling injectable products
- Laundry and waste management
- Cleaning, disinfection and sterilization of medical devices

To maintain currency and relevancy, there should be a process in place to ensure that policies and procedures are reviewed and updated on a regular basis.

HCPs should be aware of the concept of the chain of infection (refer to *National IPC Guidelines for Acute Healthcare Facilities*, Chapter 3). Risk assessment should be implemented for resident interactions. Risks are assessed for:

a) Contamination of skin or clothing by microorganisms in the resident environment

b) Exposure to blood, body fluids, secretions, excretions and/or tissues

c) Exposure to non-intact skin

d) Exposure to mucous membranes

e) Exposure to contaminated equipment or surfaces

3.2 IPC Precautions

Standard Precautions are the minimum infection prevention practices that apply to all patient care, regardless of suspected or confirmed infection status of the patient, in any setting where healthcare is delivered. These practices are designed to both protect HCPs, and prevent them from spreading infections among patients, especially those involving blood-borne pathogens. Standard Precautions include:

a) Hand hygiene;
b) Use of personal protective equipment (e.g. Gloves, gowns, masks);
c) Safe injection practices;
d) Safe handling of potentially contaminated equipment or surfaces in the patient environment; and
e) Respiratory hygiene/cough etiquette.

Additional precautions will be necessary in addition to Standard Precautions for certain pathogens or clinical presentations. For more details on Standard and Transmission-based Precautions, please refer to Chapter 4 of this document: IPC Precautions.

3.3 Hand Hygiene Programme

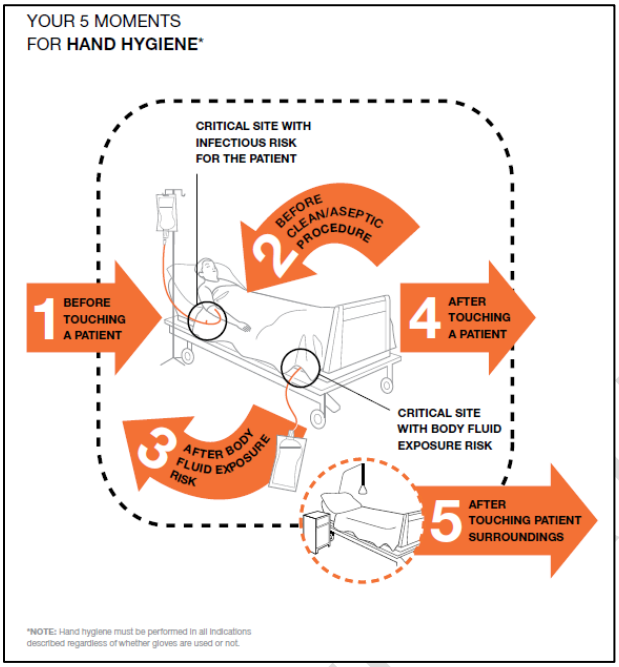
A hand hygiene programme should be implemented in the community hospital to support the prevention of transmission of microorganisms and promote the safety of patients, staff and visitors. The programme includes:

1. Senior management commitment
2. Written policies and procedures on hand hygiene
3. Provision of dedicated hand washing sinks and alcohol-based hand rub agents
4. Easy access to hand hygiene agents, especially at point of care
5. Education of staff on WHO's 5 moments of hand hygiene, proper hand hygiene techniques and appropriate hand care
6. Provision of information for patients, caregivers and visitors on hand hygiene
7. Visible reminders about hand hygiene
8. Promotion of hand hygiene by champions and role models
9. Monitoring of hand hygiene compliance with feedback to HCPs, managers and senior management and IPC Committee
10. Safety culture

3.3.1 Moments for Hand Hygiene

According to the WHO, hand hygiene should be performed at 5 key moments when working with patients. See Figure 1 below for the WHO's 5 moments for hand hygiene.

Figure 3.1: WHO 5 Moments for Hand Hygiene



Refer to Chapter 6 of the "*National IPC Guidelines for Acute Healthcare Facilities*" for details on the WHO 5 moments and hand hygiene compliance monitoring.

The Community Hospital should evaluate their hand hygiene programme at least annually using the WHO Hand Hygiene Self-Assessment Framework tool for this purpose.

3.4 Sharps Injury

3.4.1 Injury Prevention Programme

As accidental needle-stick injuries are a common occupational hazard in healthcare, each community hospital shall have a Sharps Injury Prevention Programme. To achieve the goal of injury reduction or elimination, the IPC team shall work in close collaboration with the following departments, where applicable:

a) Occupational Health and Safety
b) Staff Clinic
c) Quality Improvement
d) Materials Management/ Product Evaluation

Refer to the "Sharps Prevention Programme" in Chapter 2 in the "*National IPC Guidelines for Acute Healthcare Facilities*" for more details on this programme.

3.4.2 Post-Exposure Management for Blood borne diseases (HIV, Hep B &C)

Risk assessment and counselling constitutes the basis of post exposure management. Appropriate post exposure prophylaxis (PEP) shall be provided using a case-by-case evaluation approach. If the healthcare facility is unable to provide PEP, they should refer the exposed HCP to relevant specialist centres i.e. A&E of an acute hospital or an Infectious Disease Specialist.

Occupational injuries may be divided into:

a) Percutaneous exposure (e.g. needle prick, human bites etc.)
b) Exposure via broken skin with blood, tissue or other body fluids that are potentially infectious
c) Exposure via mucous membranes

Exposures for which PEP is indicated are in the following scenarios:

a) Break in the skin by a sharp object that is contaminated with blood, visible blood fluid or other potentially infectious material or sharp objects that had been in the source patient's blood vessel;
b) Bite from a patient with visible bleeding in the mouth and which causes bleeding in the exposed HCP; or
c) Splash of blood, visibly bloody fluid or other potentially infectious material to a mucosal surface (mouth, nose eyes).

3.4.3 First Aid

a) Wound should be washed immediately and thoroughly with soap and water. Avoid alcohol, hydrogen peroxide and other chemical cleansers. Do not squeeze or suck the wound;
b) For mucosal contact, flush the affected area with plenty of clean running water;
c) The exposed HCP should seek immediate medical advice at the facility's staff clinic equivalent (if available) or the nearest A&E of a hospital for proper wound care and post-exposure management;
d) The following information should be recorded in the exposed HCP's confidential medical record

i. Details about the source patient (e.g. name, NRIC number, diagnosis and any relevant information)
ii. Date, time and place of exposure
iii. Details of the procedure being performed
iv. Use of protective equipment at the time of exposure
v. The type, severity and amount of fluid to which the HCP was exposed

e) The HCP should be tested for HIV antibody, HCV and HBV antigen and antibody; and
f) The source patient's blood (if available) should be tested for HIV, HCV and HBV;

All community hospitals shall have a mechanism in place for reporting and managing blood and body fluid exposure in the occupational setting. HCPs must know the reporting process to facilitate quick and smooth flow in order to allow the attending physician to evaluate the risk of exposure and provide prompt appropriate post-exposure treatment. In addition, a surveillance system of exposure events should be available to avoid similar incidents from occurring in the future. Refer to "Post-exposure management and prophylaxis for HIV, HBV & HCV" in Chapter 2 of the "*National IPC Guidelines for Acute Healthcare Facilities*" for details on protocols.

3.5 Environmental Hygiene

Environmental surfaces have been implicated in healthcare associated infections (HAIs) transmission. An environmental hygiene programme needs to be in place to achieve this goal. Adequate resources, including human resources, are dedicated to environmental hygiene to ensure that the quality of cleaning meets best practices. Refer to "Environmental Cleaning" in Chapter 7 of the "*National IPC Guidelines for Acute Healthcare Facilities*" for details on the environment hygiene programme.

An environmental risk assessment may be done by the IPC team in collaboration with the environmental service staff. Refer to Table 9.5 in "Environmental Cleaning" of the "*National IPC Guidelines for Acute Healthcare Facilities*" for examples of how this can be done. This will guide the planning of cleaning schedule of the hospital. The programme should also include monitoring of cleaning practices so that improvement initiatives may be planned to meet best practices.

3.5.1 Equipment Hygiene Programme

All equipment should be cleaned and disinfected as per manufacturer's instructions. Shared items should be disinfected using hospital approved disinfectant in between each patient use. Details of the list of disinfectants available can be found in the "*National IPC Guidelines for Acute Healthcare Facilities*". Items that need to be reprocessed by sterilization is to be done by a licensed reprocessor who complies with the sterilization principles as listed in the "*National IPC Guidelines for Acute Healthcare Facilities*".

3.6 Waste Management

Proper waste management in healthcare settings can prevent potential healthcare associated infections. Management of healthcare waste in community hospital requires a multidisciplinary approach. Each community hospital shall identify and establish proper processes to eliminate or reduce hazards associated with the disposal of healthcare waste, and manage staff activities to reduce the risk of injuries to individuals and negative impact on the environment. Each community hospital shall clearly define the roles and responsibilities of every healthcare professional in implementing these policies and procedures. A waste management team shall include IPC Committee lead, ICP, Facility Manager, HODs, Nursing leads and Facility Manager.

The Waste Management Plan shall be drafted with reference to this guideline which is based on Environmental Protection and Management Act (EPMA), the Environmental Public Health Act (EPHA) and to a certain extent, the Workplace Safety and Health Act (WSHA).

The Waste Management Plan shall include:

1. Waste segregation
2. Waste receptacle
3. Waste disposal holding areas
4. Frequency of waste collection from each location
5. Duties and responsibilities for each of the different categories of staff who will generate healthcare waste and be involved in the management of waste
6. Waste management including waste requiring special handling before final disposal
7. Contingency plan for storage of disposal of hazardous waste in the event of disease outbreak, breakdown of collection arrangements

8. Training courses and programmes
9. Emergency procedures
10. Regular audit on waste management practices
11. Review and update of Waste Management Plan periodically or when needed

Waste transport and storage methods should ensure that the health of staff and the public are protected at all times. All waste from community hospitals are normally managed by licensed staff and the waste incinerated. Hence, most waste are managed as general waste and only items that are soaked or dripping with blood are considered as infectious waste.

3.7 Management of Blood and Body Fluid Spills

In an event of blood and body fluid spills, the following are done:

a) Pour chlorine-based disinfectant (e.g. NaDCC granules or solution) of at least 10,000ppm chlorine over body fluid spills. Leave for 10 minutes to disinfect.
b) Wear gloves and use disposable paper towels to clean up body fluids spills.
c) Dispose them into a biohazard bag and mop the area with institution recommended disinfectant.

3.8 Construction and Renovation

IPC principles are to be adhered to during design of new facilities or redevelopment of existing facilities and during construction, renovation and maintenance activities, up to commissioning. Refer to Chapter 11 on "Construction and Renovation" in the "*National IPC Guidelines for Acute Healthcare Facilities*" for details on how this can be done.

Policies and procedures are to be in place to:

1. Identify IPC-related risks and risk levels associated with the construction/renovation projects using the Infection Control Risk Assessment matrix (See Page 234 of the "*National IPC Guidelines for Acute Healthcare Facilities*");
2. Identify and implement preventive measures during the project (e.g. hoarding, negative pressure at building section, dust controls, etc.)
3. Identify cleaning and disinfecting requirements during and after the project

4. Conduct regular audits to ensure that optimal environmental conditions are maintained during construction to ensure good indoor air quality
5. Issue authority to the IPC team to stop projects if there is a risk to patient or staff safety.

3.9 Recommendations

1. HCPs are to evaluate potential IPC risks in the workplace and apply appropriate IPC precautions to manage the risk.
2. A sharps injury prevention programme should be in place.
3. PPE should be readily available and easily accessible for staff safe use.
4. The community hospital shall provide training in the appropriate selection, use, removal and disposal of PPE.
5. There shall be a hand hygiene programme that include staff, patients, caregivers and visitors.
6. An environment and equipment hygiene programme should be in place to ensure a safe and clean environment and patient safety.
7. During a pandemic, the IPC programme is to be reviewed to focus attention to prevention and control of the outbreak within the facility.

3.10 References

MOH Singapore (2017). National Infection Prevention Control Guidelines for Acute Healthcare Facilities.https://www.moh.gov.sg/docs/librariesprovider5/resources-statistics/guidelines/national-infection-prevention-and-control-guidelines-for-acute-healthcare-facilities---2017.pdf

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CHAPTER 4 INFECTION PREVENTION AND CONTROL PRECAUTIONS

4.1 Standard Precautions

The purpose of Standard Precautions is to reduce the risk of transmission of pathogens (bacterium, virus, fungi or other micro-organisms) from both recognised and unrecognised sources in the healthcare setting for the prevention and control of healthcare-associated infections (HAIs). This applies to all staff involved in the delivery of patient care.

4.1.1 Hand Hygiene

Practice good hand hygiene with the use of alcohol-based rubs or hand washing with soap and water by following the 5 moments of Hand Hygiene. Refer to Chapter 3 for Hand Hygiene Programme.

4.1.2 Personal Protective Equipment (PPE)

Use appropriate Personal Protection Equipment (PPE) to protect from exposure to or contact with infectious agents.

4.1.2.1 Gloves

a) Wear gloves if there is potential to come in contact with blood, body fluids, secretions, excretions, contaminated items and performing venepunctures.
b) Wear gloves before contact with mucus membranes and non-intact skin.
c) Remove gloves after each procedure, before touching non-contaminated items, environmental surfaces or attending to another patient.
d) Remove torn or punctured gloves immediately.
e) Perform Hand Hygiene before wearing and after removing gloves.

4.1.2.2 Mask, protective eye wear / Face shield/ Visor/ Goggles

a) Wear mask and eye protection / face shield to protect mucus membranes of the eyes, nose and mouth during procedures and patient–care activities that may generate splashes or sprays of blood, body fluids, secretions and excretions.
b) Wear mask when examining a patient with respiratory tract infection symptoms.
c) Mask must be discarded after each use.

d) Perform Hand Hygiene before wearing and after removing of mask/protective eye wear/face shield.

4.1.2.3 Aprons/Gowns

a) Fluid resistant gown/apron should be worn to protect skin and prevent soiling of clothing during procedures and patient-care activities that are likely to generate splashes or spray of blood, body fluids, secretions or excretions.
b) Remove soiled apron / gown as promptly as possible and perform hand hygiene to avoid transfer of micro-organisms to other patients or environment.

4.1.3 Environmental and Equipment Hygiene

a) Environment hygiene programme is to be in place to ensure that the hospital is cleaned according to scheduled frequency.
b) Equipment/ instruments/ devices used on patients can become contaminated via simple contact but also via blood, body fluids, secretions and excretions during the delivery of care. Medical equipment and instruments/ devices must be cleaned and maintained according to the manufacturer's instructions to prevent transmission of infectious agents from patient-to-patient.
c) Commodes, intravenous pumps and ventilators must be thoroughly cleaned and disinfected before use on another patient. All such equipment and devices should be handled in a manner that will prevent healthcare workers from contacting infectious material. It is also important to clean electronic devices (e.g. computers and mobile tablets).

4.1.4 Linen Management

a) Handle, transport and process used linen soiled with blood, body fluids, secretions and excretions in a manner that prevents skin and mucus membrane exposures.
b) Avoid contamination of clothing to prevent transfer of micro-organisms to other patients and the healthcare environment.

4.1.5 Safe Injections

Take precautions to prevent injuries when handling needles, scalpels and other sharp instruments, devices during procedures, cleaning process and disposal.

a) Do not recap a used needle
b) Dispose the used needle and syringe as one unit.
c) Do not remove, bend, manipulate or break used needle by hand.
d) Discard all sharps into an appropriate puncture-resistant sharp disposal container.
e) Use a hands-free technique when passing sharps during clinical procedures
f) Remove sharps container and replace with new one immediately when it is three-quarters full and ensure that the cover is securely closed to prevent leakage or protrusion of needles/sharps.
g) Place contaminated instruments into a puncture- resistant container when transporting to the reprocessing area.
h) Treat all specimens as potentially infectious. All specimens shall be put into appropriate containers and placed into the biohazard specimen bag for transportation to prevent spillage and transmission of pathogens.

4.1.6 Management of multi-dose and single use vials

a) Visually inspect injection vial for any signs of contamination, e.g. visible dust particles. Discard vial if sterility is in question.
b) Disinfect the rubber septum of the medication vial with 70% alcohol and allow it to dry, before puncturing it with a sterile needle to draw medication.
c) Use a sterile, single-use, disposable needle and syringe for each withdrawal of medication.
d) Limit the use of multiple-dose vial to only a single patient, whenever possible, to reduce the risk of contamination.
e) Multi-dose vial should be labelled with patient's details and the date it was first opened.
f) Multi-dose vial should be discarded within 28 days of opening unless the manufacturer specifies a differently
g) Multi-dose vials for multi-patient while strongly discouraged, should be kept in a centralized medication area and should not be brought into the patient's treatment area (e.g. operating room, patient room/ cubicle)
h) Only vials that are clearly labelled by the manufacturer for multiple dose use can be used more than once.
i) A single dose medication vial/ ampoule or intravenous solution (bag, bottle or otherwise) shall be used for one patient only.

j) Do not combine or pool leftover contents for later use.
k) Do not store used single-dose vial/ampoule and intravenous solution (bag, bottle or otherwise) for later use.

4.1.7 Blood / Body Fluid Spills Management

In the event of any blood or body fluid spill, staff should adhere to the management of spills as per each facility's guidelines. Each organisation should have a Blood and Body Fluid Spills Management reference in place. The type of PPE used should be appropriate for the procedure being performed and the type of exposure to blood, body fluid or pathogen anticipated. PPE includes gloves, fluid resistant gowns or aprons, masks and eye protection/ face shields.

4.1.8 Management of staff and visitors with ARI

It is strongly recommended for all staff and visitors with acute respiratory tract infections to be advised to seek medical attention and not come to work or visit patients. All are to practise respiratory hygiene/cough etiquette as follows:

a) Cover their mouths and noses when coughing or sneezing
b) Use surgical masks (for those who are coughing)
c) Use tissues to contain respiratory secretions and dispose them in a non – touch disposal bin (e.g. a bin with foot pedal-operated lid)
d) Perform hand hygiene after contact with respiratory secretions
e) Implement measures to contain respiratory secretions in patients and accompanying individuals or visitors who have signs and symptoms of respiratory infection to prevent spread of respiratory pathogens
f) Display of posters on respiratory hygiene/cough etiquette at the points of entry and/or other public areas to remind visitors of the necessary precautions
g) Provide surgical masks for use by patients and visitors who have features of ARI
h) Provide tissues and non-touch disposal bins for use by patients or visitors to dispose of used tissues and surgical masks

4.2 Contact Precautions

The purpose of Contact Precautions is to reduce the risk of transmission of epidemiologically important pathogens (bacterium, virus, fungi or other micro-organisms) through

direct or indirect contact with a contaminated person, object and/or environment. This practice applies to all staff involved in the delivery of patient care.

Contact transmission is the most common route of transmission of infectious agents. It may involve:

- Direct contact, through touching e.g. a person may transmit microorganism to others by touching them; or
- Indirect contact, when microorganisms are transferred via contaminated objects e.g. C. *difficile* can be transmitted from an infected patient to another patient via a contaminated commode.

4.2.1 Patient Placement

Patients on Contact Precautions should ideally be accommodated in a single room with a dedicated toilet and patient sink. If single rooms are unavailable, patients should be cohorted with other patients infected with the same organisms in a multi-patient room/cubicle, preferably with an en-suite toilet.

4.2.2 Personal Protective Equipment / Hand Hygiene

a) Wear a clean long-sleeved gown / apron and gloves upon entry to the isolation room or cohort cubicle.
b) When caring for MDRO carriers in a multi-bedded cubicle:
    - Wear gloves and gown / apron only when there is bodily contact (i.e. HCW's clothing will have direct contact with the patient) or potentially contaminated environmental surfaces or equipment in close proximity to the patient.
    - Remove and discard gloves before removing gown / apron.
    - Clean hands after removing each PPE.
    - Where there is no bodily contact, hand hygiene is to be practised according to WHO 5 moments.
c) Remove gown / apron before leaving the patient-care environment and perform hand hygiene immediately.
d) After gown / apron removal, ensure that clothing and skin do not contact potentially contaminated environmental surfaces that could result in possible transfer of microorganisms to other patients or environmental surfaces.

e) During the course of providing care for a patient, change gloves after having contact with infective material that may contain high concentrations of micro-organisms (e.g. faecal material and / or wound drainage).
f) Remove gloves before leaving patient's environment and perform hand hygiene immediately.
g) After glove removal and hand hygiene, ensure that hands do not touch potentially contaminated environment surfaces or items in the patient's room to avoid transfer of microorganism to others or environment.

4.2.3 Transport of a patient under contact precautions

a) Limit the movement and transport of the patient from the room/ward to only essential purposes.
b) If the patient is transported out of the room, inform the receiving department of the need for Contact Precautions.
c) Ensure that the required precautions are maintained to minimise risk of transmission of pathogens / micro-organisms to other patients and contamination of environmental surfaces or other equipment.
d) Where the patient must be transported out of the room/ward to another clinical area(s) by trolley or wheelchair, the staff accompanying the patient during the transportation shall discard the gloves and apron/gown worn and perform hand hygiene before leaving the room with the patient. Apron/gown and gloves are not to be worn during patient transportation to prevent potential environmental contamination should other people/objects come into contact with the contaminated gloves and apron/gown along the way.
e) The trolley linen should be removed for washing immediately after transfer of an infected patient. Clean or wipe down the trolley / wheelchair used for patient transfer with hospital-approved disinfectant.
f) Patients who can spread respiratory infections should wear surgical masks while being transported.
g) If ambulance service is required for transportation, patients (who are on Contact Precautions) with following conditions should not share the ambulance with another patient.
    - Patients with diarrhoea

- Patient with large draining wounds that could not be covered
- Patient with invasive device, indwelling catheters
- Patient with *Clostridium difficile*
- Patient with CP-CRE: The ambulance should be cleaned with hospital-approved disinfectant after the transportation

4.2.4 Patient-Care Equipment and Linen

Where possible, dedicate the use of non-critical patient-care equipment such as bedside commodes and items such as stethoscopes, sphygmomanometers etc. to a single patient (or cohort of patients infected or colonised with pathogens) to avoid sharing among patients to reduce risk of cross-contamination.

Where sharing the use of common equipment or items among several patients is unavoidable, these must be adequately cleaned and disinfected before the same item(s) are used by or for another patient. Contaminated linen should be handled as little as possible to prevent possible transmission of pathogens.

All linen from the patient's isolation room should be handled as per the institution's isolation / infection prevention protocol.

Table 4.1: Disease Types & Duration of Contact Precautions

Disease	Precaution
Draining abscesses	• Duration of illness. • Until there is no dressing or dressing does not contain drainage; or until drainage stops or can be contained by dressing. • Add Droplet Precautions for the first 24 hours of appropriate antimicrobial therapy if invasive Group A Streptococcal disease is suspected.
Gastroenteritis (bacteria/ viral) Adenovirus	• Duration of illness. • Use Contact Precautions for diapered or incontinent persons

Campylobacter species Cholera *Clostridium difficile* *Cryptosporidium* species Rotavirus Noroviruses *E. coli* (*O157:H7 and other shiga toxin-producing strain*s) Salmonella species *Bacillary dysentery* *Vibrio parahaemolyticus* *Yersinia enterocolitica*	• For *C. difficile,* the use of gloves is encouraged, followed by hand hygiene with soap and water after removal of the gloves. • Wear surgical mask and use sodium dischloroisocyanurates to clean areas heavily contaminated with faeces or vomitus.
Acute viral haemorrhagic conjunctivitis	• Duration of illness. • Ensure used instruments and equipment are adequately cleaned and disinfected between patients.
Diphtheria (cutaneous)	• Until 2 cultures taken 24 hrs apart negative
Disseminated Herpes zoster/ Varicella	• Apply contact & airborne precautions. • Contact Precautions is for herpes zoster lesions, which can be covered. Airborne isolation precautions required if lesions cannot be covered or during dressing. • Maintain precautions until lesions dry and crusted. • Place remaining exposed susceptible patient on precautions beginning 10-21 days after last exposure (up to 28 days if VZIG has been given).
Hepatitis A gastro-enteritis in diapered or incontinent patients	• Maintain precaution when nursing infants and children <3 years of age for duration of hospitalisation; in children 3-14 years of age for 2 weeks, in >14 years, until 1 week after onset of symptoms. Perform handwashing if soiled. To wear an apron should there be risk of soilage.
Herpes simplex (Mucocutaneous, disseminated / primary, severe)	• Maintain precautions until lesions dry and crusted.

Lice (head)	• Until 24 hours after initiation of effective therapy.
Scabies	• Until 24 hours after commencement of treatment; longer if crusted
Respiratory syncytial virus, parainfluenza viruses or enteroviral infections in infants and young children	• Duration of illness, (In immunocompromised patients, extend the duration of precautions due to prolonged shedding)
Multidrug-resistant organisms (MDROs), infection or colonization (e.g., MRSA, VRE, VISA/VRSA, ESBLs, resistant S. pneumoniae)	• Maintain Contact Precautions for colonisation or infection including wounds/ drainage/ secretions/ excretions that cannot be contained; respiratory tract infection/ tracheostomy or gastroenteritis.
Any other Multi- Resistant Bacteria (MRB) as deemed requiring contact precaution by infection control	• Maintain contact precautions until clearance is determined.

4.3 Droplet Precautions

The purpose of practicing droplet precautions is to reduce the risk of transmission of pathogens (bacterium, virus or other micro-organisms) generated by patients during coughing, sneezing, talking or during the performance of procedures for patients with highly transmissible pathogens. These precautions are to be used in addition to Standard Precautions during the care of specific patients known or suspected to be infected with epidemiologically important transmissible pathogens spread through droplet transmission.

4.3.1 Patient Placement/ Signage

a) Place a patient known or suspected to be infected with epidemiologically important pathogens spread through droplet transmission in a single room (for isolation) if available.
b) Droplet Precaution signage to guide people on the precautions to be taken, with instructions for appropriate donning and removal of PPE, should be displayed at the entrance of the patient's room.
c) When single rooms are unavailable;

i. Prioritise patients who have excessive cough and sputum for single room placement.
ii. Cohort patients known and/or suspected to be infected with the same pathogens together in the same room. Place them at a bed distance of > 1.5 meters.

4.3.2 PPE

Healthcare professionals (HCPs) should wear a surgical mask before any close contact with a patient potentially infectious with a droplet spread disease; hand hygiene should be performed before putting on and after removing mask and PPE.

4.3.3 Patient Transport

a) Limit the movement and/or transport of isolated and/or cohorted patients from their rooms or ward cubicles to other clinical areas for essential purposes only.
b) During transportation, the staff should remove all PPE except the surgical mask. Apron/gown and gloves are not to be worn during patient transportation to prevent potential environmental contamination should the contaminated gloves and apron/gown come into contact with other people/objects along the way.
c) The infected patient shall wear a surgical mask to minimize the dispersal of droplet nuclei during transportation.
d) All receiving units / departments of infected patients must be notified in advance so that adequate infection control preparations can be made.
e) After the transfer, all PPE shall be disposed of following the standard protocol for contaminated items and hand hygiene performed.
f) All transport equipment shall also be disinfected with hospital recommended disinfectant.

Table 4.2: Disease Types & Duration for Droplet Precautions

DISEASE	DURATION
Invasive *Haemophilus influenzae* Type B disease (including pneumonia in infants and children, meningitis, epiglottitis)	For 24 hours from time of initiation of effective therapy

DISEASE	DURATION
Invasive N*eisseria meningitidis* Disease (including meningitis, pneumonia and sepsis)	For 24 hours from initiation of therapy
Invasive Multidrug Resistant *Streptococcus pneumoniae* Disease (including meningitis, pneumonia, sinusitis and otitis media)	For 24 hours from initiation of therapy
Diphtheria (pharyngeal)	Until end of antibiotic therapy and two cultures taken at least 24 hours apart are negative
Mycoplasma Pneumonia	For the duration of illness
Pertussis	Maintain precaution for 5 days from the time patient is placed on effective therapy
Pneumonic Plague	For 48 hours after initiation of therapy
Group A Streptococcal Pharyngitis, pneumonia or scarlet fever in infants and young children. Maintain precautions until all lesions are crusted.	For 24 hours after initiation of therapy
Adenovirus	For the duration of illness
Rhinovirus	For the duration of illness
Influenza	For 5 days after initiation of therapy except for immunocompromised patients for whom precautions must be taken for the duration of illness.
Mumps	For 5 days from the onset of swelling
Parvovirus B19	Maintain precautions for the duration of hospitalization where this chronic disease occurs in an immunodeficient patient. For patients with transient aplastic crisis or red cell crisis, maintain

DISEASE	DURATION
	precautions for 7 days. Duration of precautions for immunosuppressed patients with persistently positive PCR not defined, but transmission has occurred.
Rubella	For 7 days from onset of rash
HFMD (Hand Foot Mouth Disease)	Isolate for the entire duration of hospitalization

4.4 Airborne Infection Isolation (AII) Precautions

The purpose of practicing AII Precautions is to reduce the risk of airborne transmission of micro-organisms from patients with highly transmissible pathogens.

These precautions are to be used in addition to the Standard Precautions during the care of specified patients known or suspected to be infected with epidemiologically important pathogens spread by airborne transmission.

4.4.1 Patient Placement

A patient with suspected or proven airborne disease is best managed in an acute care hospital in negative pressured isolation rooms. However, the patient can continue care in a community hospital if there are negative pressured isolation facilities available.

a) Place patient in single room that has:
   - Monitored negative air pressure in relation to the surrounding area
   - A minimum of 12 air changes per hour
   - Inward directional airflow from adjacent spaces to the room with negative pressure differentials of more negative than -2.5 Pascal.
   - Air should flow from room entry door, across the bed area, and exit (exhaust) from the en-suite toilet to the furthest part of the room.

b) If the above is not possible, a single room with an opened window is adequate. A fan, if used should be directed towards the window, until the ambulance arrives to fetch patient to an acute care hospital for further management.

c) New/ renovated AII rooms should come with an anteroom. The most contaminated area should have the most negative relative air pressure (e.g. relative air pressure should be

most negative in the patient's room, less negative in the anteroom and neutral at the common corridor.

d) All room exhaust air must be HEPA-filtered
e) Room pressure must be checked before entering the room and pressure reading monitored daily when in use.
f) Room walls should have all penetration points sealed.
g) All cracks, gaps and wall stipples must be properly sealed.
h) All surfaces and fabrics (e.g. curtains, chairs) should be impervious to liquid.
i) Keep the patient in the room with the door closed except on entry or exit of HCWs.
j) When a single room is not available, cohort patients with the same pathogen unless otherwise recommended.

4.4.2 Respiratory Protection

a) Wear N95 mask when entering the room of a patient known or suspected to be infected with airborne pathogens.
b) Appropriate PPE should be used when performing aerosol-generating procedures associated with risk of pathogen transmission (e.g. intubation, bronchoscopy).
c) Perform N95 mask or respirator fit seal check each time a N95 mask is donned to check leakage around the face piece. Avoid touching the mask once applied. Change the respirator if wet or soiled. Remove N95 mask or respirator after exiting the patient's room or in an anteroom after ensuring that the door of the patient room is closed. Discard the respirator into the appropriate waste bin and perform hand hygiene immediately.

4.4.3 Equipment /Consumables

Where possible, dedicate the use of non-critical patient care equipment and items such as stethoscope, sphygmomanometer or bedside commode to a single patient. If sharing of common equipment or items is unavoidable, ensure adequate cleaning and disinfection between patient use. Contaminated linen should be handled as little as possible to prevent gross microbial contamination of the air. All linen from the patient's isolation room should be handled as per hospital protocol.

4.4.4 Dishwasher and Eating Utensils

The combination of hot water and detergents used in dishwashers is sufficient to decontaminate dishware and eating utensils. Therefore, no special precautions are needed for dishware (e.g. dishes, glasses, cups) or eating utensils.

4.4.5 Environment Cleaning

Patient care items, bedside equipment, linen and frequently touched surfaces should be cleaned in between patient use. Environmental and surfaces cleaning of the isolation room with hospital approved disinfectant should be performed daily with special attention given to frequently touched surfaces.

4.4.6 Patient Transport

a) Limit patient's movement and transport from the room to essential purposes only.
b) HCP involved in patient's transfer should wear an N95 mask or respirator during transportation of patients.
c) Patient is to wear a surgical mask to minimise the dispersal of droplet nuclei during transfer.
d) All receiving units/departments must be notified in advance so that adequate infection control preparations can be made.

After the patient transfer, HCP is to dispose of all PPE used in the appropriate manner and perform hand hygiene (refer to Hand Hygiene Policy & Procedure). Disinfect transport equipment with hospital recommended disinfectant.

4.4.7 Personnel Restriction

Whenever possible, health care professionals with significant immunosupression should not enter the rooms of patients known or suspected to have measles, chickenpox, disseminated zoster or TB.

4.4.8 Visitors

a) Patient with TB:

Household contacts have already been exposed and hence, do not need to wear an N95 respirator but should wear a surgical mask.

Visitors who are non-household contacts should be discouraged from visiting. Potentially infectious visitors are to be excluded from visiting until they have received appropriate medical screening, diagnosis, or treatment.

b) Patient with varicella and measles

Household contacts have already been exposed and so do not need to wear N95 respirator but should wear surgical mask. They should be assessed for presence of active infections before visiting.

Visitors who are known to be immune or vaccinated do not need to wear an N95 respirator but should wear a surgical mask. Visitors with acute infections should avoid visiting patients.

Visitors who are non-household contacts, not immune or vaccinated, and have no history of varicella and measles should be discouraged from visiting the patient

4.4.9 Communication of patient status

Patients should be identified as per hospital protocol as follows:

a) Displaying an airborne precaution sign outside the isolation room to alert and guide healthcare professional on wearing of appropriate PPE.
b) Indication on investigation or procedure request form (e.g. Radiology, Physiotherapy, operations etc.) that the patient is on AII precautions to alert staff on the infection risk.
c) Notification of the receiving department or healthcare facility before transporting or transferring the patient to allow adequate preparation of infection prevention and control measures.

4.5 Recommendations

1. Standard Precautions should be part of the work culture of all healthcare settings and the daily practice of each HCP during the care of all patients at all times.
2. A risk assessment should be made by the HCP before each interaction with a patient or contact with their environment to determine the precautions that are required to prevent disease transmission during the planned interaction.
3. A comprehensive hand hygiene program should be established in all healthcare facilities.

4. All HCPs and other staff who may be exposed to body fluids should receive education on the proper use of PPE.
5. Gloves should be worn when it is anticipated that the hands will be in contact with body fluids, or equipment and environmental surfaces that are contaminated with body fluids.
6. Gloves may not be necessary for routine healthcare activities where contact is limited to the intact skin of the client/patient.
7. Hand hygiene should be performed before putting on and after removal of gloves for aseptic procedures.
8. Gowns are to be removed immediately after the task for which it has been used in a manner that prevents contamination of clothing or skin and prevents agitation of the gown.
9. A mask and eye protection should be worn to protect the mucous membranes of the eyes, nose and mouth when it is anticipated that a procedure or care activity is likely to generate splashes or sprays of body fluids.
10. Patients who visibly soil the environment or for whom appropriate hygiene cannot be maintained are to be placed in single rooms with dedicated toileting facilities.
11. A sharps injury prevention program should be implemented in all health care settings.

4.6 References

United States Centers for Disease Control and Prevention (CDC). 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings (pp 14 – 40) Available at: http://www.cdc.gov/hicpac/pdf/isolation/Isolation2007.pdf

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CHAPTER 5 PATIENT CARE PRACTICES

5.1 Prevention of catheter-associated urinary tract infection (CAUTI)

5.1.1 Introduction

The presence of a urinary catheter and the length of time it remains in-situ are contributory factors to the development of a catheter-associated urinary tract infection (CAUTI). An average of 25% of hospitalized patients are catheterized at some point during their hospitalization, therefore, it is important that guidelines for the prevention of CAUTI are in place to minimize the risk of infection.

5.1.2 Surveillance

Refer to the *MOH Surveillance Technical Manual of National Infection Control Indicators* for definitions to be used in CAUTI surveillance.

5.1.3 Indications for use of urinary catheter

The urinary catheter is to be inserted using aseptic technique only under appropriate indications e.g.

- To relieve clinically significant urinary retention of bladder outlet obstruction (temporary relief or longer-term drainage if medical therapy not effective and surgical correction not indicated).
- To assist the healing of an open sacral sore or perianal wound.
- To monitor accurately the urine output in critically ill patients.
- During prolonged surgical procedures with general or spinal anaesthesia, selected urological and gynaecological procedures.
- For patients requiring prolonged immobilization e.g. potentially unstable thoracic or lumbar spine, multiple traumatic injuries such as pelvic fractures.
- Improvement in comfort in end of life care if needed.
- Management of gross haematuria with blood clots in urine.

Prior to catheterization, consideration should be given to alternative management methods (e.g. urosheath or intermittent catheterization). Urinary catheters should only be used

when necessary and should be removed as soon as possible to avoid potential complications such as infection, bacteraemia, urethritis, urethral stricture, haematuria and bladder perforation.

5.1.4 Types of Catheters Used

Types of catheters used will be dependent on the duration the catheter is recommended to be in situ. The recommended duration should be according to manufacturers' instructions.

Silver-coated catheters are recommended to reduce the incidence of bacteriuria; however, there is insufficient evidence on the reduction of CAUTI in short-term catheters. Silver-coated catheters are more costly than a Foley's catheter and are not recommended for routine use.

Antimicrobial-impregnated catheters may reduce the risks of CAUTI in the short-term catheterization, but also are not recommended for routine use.

Accurate catheter size and inflation of balloon should be determined to minimize factors that will contribute and increase the prevalence of CAUTI.

- Urethral trauma
- Mucosal irritation
- Residual urine

Appropriate catheter sizes: (Use as small a catheter as possible, which is consistent with proper drainage, to minimize urethral trauma).

- Female: 10-14 Fr
- Male: 12-16Fr
- Suprapubic: 16-18Fr
- Appropriate lengths:
- Female length 20-25cm
- Standard length (usable by both Male & Female patients): 41-45cm

5.1.5 Insertion Precautions

HCPs performing urethral catheterization should be trained, assessed and credentialed as competent on the technical aspects, including application of the principles of aseptic technique to minimize the risk of infection.

Standard Precautions must be applied by all healthcare personnel when inserting and caring for patients with urinary catheters. Surgical hand hygiene must be performed immediately before donning sterile gloves prior to insertion of a urinary catheter and after removal of PPE. Sterile equipment and aseptic technique must be used during insertion of urinary catheters. As infection can occur extra-luminally (via the external surface of the catheter) when the catheter is inserted, the urethral meatus should be carefully cleaned prior to catheterization. An appropriate lubricant or anaesthetic gel from a single-used container should be applied to the urethral meatus and catheter surface prior to the insertion of the catheter to minimize urethral trauma or infection.

The indwelling catheter should be connected to a closed drainage bag which is always placed below the level of the bladder to facilitate drainage.

When a catheter is inserted, the following information should be documented in the patient's record.

a. Indication for catheter insertion
b. Date and time of catheter insertion
c. Type and size of catheter used
d. Any complications encountered
e. Name of healthcare personnel who inserted the catheter

5.1.6 Maintenance precautions

The prompt removal of the device when not required is the primary approach to prevention of infection. Where catheterisation is indicated, strict adherence to device maintenance is recommended.

Key features in the maintenance bundle include:

a) Daily review of the need for the urinary catheter
b) Check the catheter has been continuously connected to the drainage system
c) Ensure patients are aware of their role in preventing urinary tract infection – perform routine daily meatal hygiene.
d) Empty the collecting bag regularly or when half-filled using a separate collecting container for each patient.

e) Maintain unobstructed urinary drainage by keeping the collecting bag below the level of the bladder and preventing kinking of the catheter and collecting tubes.
f) Perform hand hygiene and don gloves and apron prior to each catheter care procedure; on procedure completion, remove gloves and apron and perform hand hygiene again.

Maintaining a closed urine drainage system

a) Ensure that the drainage port or spigot of the urinary bag does not come in contact with non-sterile surfaces.
b) Swab the drainage port with 70% alcohol swab before opening, prior to closing and after closing of the drainage port, when emptying the bag.

Maintain unobstructed urine flow

a) Ensure that the collecting bag always remains below the level of the bladder. Do not rest the bag on the floor or bed.
b) Empty the urine bag regularly or when half filled, using a separate, clean collecting container for each patient; avoid splashing, and prevent contact of the drainage port with the non-sterile collecting container.
c) Keep catheter and drainage tube free from kinks.
d) Replace poorly functioning / obstructed catheters.
e) Clamp catheter only on specific instructions from physician e.g. weaning off catheter or collection of specimen.

Changing of urine bag

Change urine bag accordingly to manufacturer's recommendation. Perform hand hygiene before and after and ensure gloves are donned. Be mindful not to contaminate the tip of the bag and catheter port when reconnecting. To maintain the closed drainage system, changing of IDC and IDC bag should be done as one system and as opposed to changing the IDC bag separately. Indicating the date of change on the urine bag is not required. Changing drainage bags at routine, fixed intervals is not recommended. Rather it is suggested to change catheters and drainage bags based on clinical indications such as infection, obstruction, or when the closed system is compromised.

Always practice Standard Precautions including the use of gloves and gowns as appropriate, during any manipulation of the catheter or collecting system. Do not use antimicrobials routinely to prevent catheter-associated urinary catheter infection unless clinical indications exist. Do not routinely clean the periurethral area with antiseptics as an adjunct measure to prevent catheter-associated urinary tract infection. Basic hygiene such as cleansing the meatal surface with soap and water during daily bathing or showering is appropriate.

Avoid bladder irrigation unless obstruction is anticipated (e.g. bleeding after prostatic or bladder surgery). The prevailing protocols for bladder irrigation in the institutions shall apply. If bladder irrigation is necessary, a 3-way triple lumen catheter is preferred for frequent/continuous bladder irrigation. The following should be observed if the catheter has to be disconnected for bladder irrigation:

a) Sterile techniques should be used whenever the collecting system is opened for bladder irrigation.
b) A large volume sterile syringe and sterile irrigation fluid should be used and then discarded.

If intermittent catheterization is undertaken, perform it at regular intervals to prevent bladder over distension. If ultrasound bladder scanners are used, ensure that indications for use are clearly stated, healthcare personnel are adequately trained in their use, and equipment is adequately disinfected in between patients.

5.1.7 Specimen collection

Obtain urine sample aseptically. If a small volume of fresh urine is needed for examination (i.e. urinalysis or culture), clamp the catheter and aspirate the urine from the sampling port with a sterile syringe/cannula adapter after cleansing the port with 70% alcohol.

5.1.8 Change of catheter

Catheter should be changed when clinically indicated, such as when there is an infection, obstruction or when the closed system is compromised / in line with manufacturer's recommendation. Replace catheter when sediment or concretion can be palpated in the catheter or when malfunctioning or obstruction occurs.

Avoiding and minimizing duration of urinary catheterization remains the key strategy in the prevention of CAUTIs, as continued urethral catheterization is associated with a 3 – 10% daily incidence of bacteriuria. Various reminder systems to review the continuation of catheterization have been shown to be efficacious and cost-effective and should be implemented.

Such strategies include:

a) Nurse generated daily verbal reminders or reminder stickers to physicians to review appropriateness of continuing catheterisation.
b) Computer generated reminders to review indications for continuing catheterisation.
c) Pre-written or computer-generated 'stop orders', whereby a catheter was removed by default after a set period or when certain clinical criteria are met. Nurse-led, protocol driven review systems have also been found to be effective.
d) The routine use of antibiotic prophylaxis for the prevention of CAUTI has not been shown to reduce symptomatic cather associated UTIs.

5.2 Prevention of Healthcare Acquired Pneumonia (HAP)

5.2.1 Introduction

HAP is defined as an infection of the lower respiratory tract acquired after at least 48 hours of admission to hospital and is not incubating at the time of admission.

The probable sources of colonization are assumed to be:

a) Endogenous sources: upper respiratory tract, the stomach and intestines
b) Exogenous sources: from another patient or healthcare staff. This will most probably occur via hands of healthcare staff, involving direct inoculation of micro-organisms into the tracheobronchial tree during the manipulation of ventilator circuits or tubes.
c) The environment i.e. air, water, sink, faucets, respiratory care equipment and fomites
d) Tube feeding formulas
e) Micro-aspiration of oropharyngeal organisms

Risk factors for the development of HAP can be differentiated into modifiable and non-modifiable conditions.

- Modifiable risk factors can be changed with implementation of measures. These include:

1. Intubation and mechanical ventilation
2. Enteral nutrition and malnutrition
3. Supine positioning of patient
4. Oropharyngeal colonization
5. Stress ulcer prophylaxis
6. Exposure to antibiotics
7. Poor glucose control

- Non-modifiable risk factors are mostly patient-related and cannot be changed:
    1. Extremes of age
    2. Multiple organ system failure
    3. Pre-existing pulmonary diseases
    4. Presence of underlying morbidity and impairment of the local and systemic host defenses.

Bacteria causes most cases of HAP and many infections are polymicrobial. Aerobic gram-negative bacilli and gram-positive cocci are the most common pathogens. These include *Pseudomonas aeruginosa, Klebsiella pneumoniae*, *Acinetobacter baumanii and Staphylococcus aureus.*

There should be ongoing surveillance to monitor outcome measures. Refer to the *MOH Surveillance Technical Manual of National Infection Control Indicators.*

5.2.2 Precautionary Measures

5.2.2.1 Patient

a) Place patient in a room/bed with good ventilation and air flow
b) If patient is placed in a general ward, there must be bed separation of at least 1.5 m apart from the next patient.
c) If the pneumonia is due to MDRO, manage as for a MDRO patient.

5.2.2.3 Precautions

a) All staff must always practice good hand hygiene and strictly follow the 5 Moments of Hand Hygiene and comply with Standard Precautions.

b) For patients with HAP, use gloves and wear apron if there is a potential contact with blood, body fluids or respiratory secretions.
c) Change gloves and perform hand hygiene:
    - Between contacts with different patients
    - After handling respiratory secretions or objects contaminated with secretions from one patient and before contact with another patient, object or environmental surface
    - Between contacts with a contaminated body site and the respiratory tract of or a respiratory device on the same patient.
d) Change apron in between care of patients.
e) Wear surgical mask if there is a potential contact with respiratory secretions e.g. during suctioning or chest physiotherapy.

5.2.2.4 Care of Respiratory Equipment

a) Single use respiratory equipment should not be reused unless there are no adverse consequences in doing so.
b) Do not share nasal prongs and masks among patients. Change the items when they are dirty.
c) Thoroughly clean all equipment and devices to be sterilized or disinfected.
d) All respiratory care items should be stored in a clean area away from exposure to dust, excess heat or moisture.
e) Change nebulizers, reservoirs and humidifiers following manufacturer's recommendation.
f) Ensure reusable humidifier reservoirs used with oxygen outlets are disconnected and cleaned daily.

5.2.2.5 Care of Patient with Tracheostomy with Pneumonia

a) Perform tracheostomy care under aseptic conditions.
b) Wear mask, apron and sterile gloves to change a tracheostomy tube under sterile conditions with aseptic technique.
c) Change inner tubes of tracheostomy daily and/or whenever necessary for cleaning and disinfection. Rinse the tube with sterile water and air dry. Keep it in a dry and clean place if not in use. For metal inner tubes, replace with one that has undergone sterilization or high-level disinfection.

d) Clean the skin around the tracheostomy site daily with normal saline and dress it with sterile dressing.

5.2.2.6 Suctioning of Respiratory Secretions

a) Minimize risks of infection when suctioning the respiratory tract
b) Perform hand hygiene thoroughly before and after performing suction
c) Wear gloves, apron and surgical masks when performing suctioning
d) Suction only if necessary and carry out intermittent suctions gently
e) Use sterile, single-use catheter for each series of suctioning
f) If patient is on tracheostomy and has a viscid secretion, it may be necessary to loosen the secretions by using heated humidifier or heat moist exchanger.
g) Change suction connecting tubing and suction collection canister at least once every 24 hours

5.2.2.7 Prevention of Aspiration

a) Discontinue the use of feeding tubes and respiratory tubes when not indicated
b) Place at risk patients in semi-recumbent position i.e. 30 to 40 degrees angle, especially during feeding and transportation, unless contraindicated.
c) Routinely check position of feeding tubes as per institution's protocol. Verify the placement of the feeding tube is in the proper position prior to starting each feed.

5.2.2.8 Reduction of Oral-Pharyngeal Colonization

a) Develop and implement a comprehensive oral hygiene programme. Maintain optimal oral and dental health. Tooth decay is best attended to as soon as possible.
b) Daily or twice a day oral toilet for enteral and non-oral enteral feeding patients
c) Brushing of teeth should be encouraged
d) Limit the use of gargle unless used for treatment of oral condition

5.3 Recommendations

1. Insertion and maintenance policies are to be in place to prevent CAUTI in the community hospitals.
2. Policies and procedures are to be in place to prevent HAP in the community hospital.

5.4 References

Association for Professionals in Infection Control and Epidemiology. Guide to Elimination of Catheter-Associated Urinary Tract Infections (CAUTIs), An APIC Guide 2008

Maki DG, Tambyah PA. Engineering out the risk for infection with urinary catheters. Emerg Infect Dis. 7(2):342-7. Doi:10.3201/eid0702.700342.

National Infection Prevention Control Guidelines for Acute Healthcare Facilities, 2017

The National Infection Prevention and Control Guidelines for Long-Term Care Facilities (LTCs) Technical Manual for Surveillance of National Infection Control Indicators, Ministry of Health

National Infection Prevention and Control Guidelines for Acute Health-care Facilities, 2017. Available from: https://www.moh.gov.sg/docs/librariesprovider5/resources-statistics/guidelines/national-infection-prevention-and-control-guidelines-for-acute-care-facilities--2017

Guidelines for Prevention of Nosocomial Pneumonia. Available from: https://www.cdc.gov/mmwr/preview/mmwrhtml/00045365.htm

Preventing hospital-acquired Pneumonia (HAP) outside of the ventilator-associated pneumonia bundle. Available from: https://apic.org/Resource/TinyMceFileManager/Periodical_Images/Preventing_HAP_Fall2015.pdf

CHAPTER 6 SURVEILLANCE AND OUTBREAK MANAGEMENT

6.1 Surveillance

As part of a holistic IPC programme, the IPC committee should determine a set of indicators to reflect the institution's IPC risk and evaluate the effectiveness of measures taken to mitigate the risk. As part of the IPC team's annual plan, a set of indicators, which could include both process and outcome indicators, should be selected based on each institution's context. This may include device associated infections and hospital onset MDROs (CAUTI, HAP, HO-MRSA, HO-CP-CRE, etc). The *MOH Surveillance Technical Manual of National Infection Control Indicator* has been developed for the acute hospitals, but can be a useful reference for developing measurement definitions.

Reports should be shared with the Infection Prevention & Control Committee, Medical Board, Medical Director, Director of Nursing, and other relevant stakeholders. The data should be used to detect epidemics and lapses in infection prevention practices, and should inform future plans for the IPC programme.

6.2 Recommendations

1. Surveillance programme is to be established to assist in tracking areas of concern with the aim of improving infection prevention practices and achieving patient and staff safety.
2. Reports should be shared with leadership and relevant stakeholders in a timely manner for necessary actions to be taken, if required.
3. During a pandemic, IPC measures to be taken are aligned with national guidelines.

6.3 References

MOH Surveillance Technical Manual of National Infection Control Indicators
https://www.cdc.gov/nhsn/pdfs/pscmanual/7psccauticurrent.pdf (accessed on 20/1/19)

https://www.cdc.gov/nhsn/pdfs/pscmanual/6pscvapcurrent.pdf (accessed on 20/1/19)

https://www.cdc.gov/nhsn/pdfs/pscmanual/9pscssicurrent.pdf (accessed on 20/1/19)

6.4 Outbreak management

For outbreak management, refer to 'Outbreak Management' in Chapter 5 of the "*National IPC Guidelines for Acute Healthcare Facilities*".

CHAPTER 7 MULTI DRUG RESISTANT ORGANISMS AND CLOSTRIDIUM DIFFICILE

7.1 MDRO Prevention Programme

The IPC programme should include a long-term approach and relevant policies to prevent MDRO transmission within the hospital. The programme should include surveillance, audit and education sessions for staff to help them understand appropriate actions to be taken.

7.1.1 Placement

Multi-drug resistant organisms (MDRO) refer to micro-organisms of national epidemiological concern viz. methicillin-resistant *Staphylococcus aureus* (MRSA), carbapenemase producing carbapenem resistant *Enterobacteriace* (CP-CRE), *Candida auris*. Patients with MDRO carriage should be isolated to the institution's best effort – this could either be isolated in single rooms (where available) or cohort cubicles with en-suite toilet facilities, where cohort refers to two or more patients with the same MDROs who are placed together in the same facility or cubicle and/or physically separated from other patients by their location. If neither options are available, IPC team should be consulted on how best to house such patients, and the mitigating measures that should be taken to reduce risk of transmission to other patients.

7.1.2 Active surveillance, untagging and contact tracing

Active surveillance is not routinely done for all patients but if conducted, please refer to *National IPC Guidelines for Acute Healthcare Facilities* for methods to be used. In addition, the community hospitals may also consider periodic MRSA screening for in patients, especially long stayers.

Untagging of MDRO status should not be done by community hospitals.

Contact tracing of patients with newly diagnosed CP-CRE are to be done by the IPC team.

7.1.3 Precautionary Measures

Ideally, MDRO positive status, if any, should be made known on arrival to the community hospital for isolation precautions to be instituted.

Contact Precautions should be strictly practiced for all MDROs in isolation or cohort areas by all staff attending to the patient. Where there is significant body contact during care, gown and gloves are to be worn; otherwise hand hygiene by staff is the key preventive measure to break chain of infection. Visitors and caregivers do not need to wear gown and gloves but should be taught to practice hand hygiene.

Practice Contact and Droplet Precautions for patients who are respiratory dispersers.

Patient should continue with physiotherapy or rehabilitative activities – where there is significant body contact, staff are to wear gown and gloves. Any common equipment used should be disinfected with hospital approved disinfectant.

Nursing notes, charts, X-rays, etc. are not to be taken into the patient's room or cubicle. Documentation is to be done outside the patient's room or cubicle. Dedicated instruments or equipment is to be provided for care of MDRO patients e.g. stethoscope, sphygmomanometer, commode chair, wheelchair and pulse oximeter.

Upon admission or transfer to isolation or cohort cubicle, the doctor/nurse responsible for the patient should explain to the patient and relatives the reason for precautions, special precautions to be taken and any patient/visitor restrictions.

Handle, transport and process used linen soiled with blood, body fluids, secretions and excretions in a manner that prevents skin and mucous membrane exposures, contamination of clothing, and avoid transfer of microorganisms to other patients and the environment. If a pressure relieving mattress from vendor is used for the patient, bag the mattress into a bag with proper indications prior to collection by vendor.

Environment and equipment hygiene are critical factors in the prevention programme. Where there are one or more patients infected with *Clostridium difficile* in the room/ward cubicle, decontaminate all surfaces within the room/ward cubicle with sodium hypochlorite disinfectant of a 1:10 dilution (or 5,000 parts per million available chlorine).

Routine decolonization of known MRSA patients is not recommended. If done, please refer to *National IPC Guidelines for Acute Healthcare Facilities* for methods to be used and criteria to be adopted for clearance.

Routine screening of staff for MRSA carriage is not recommended, except during outbreaks, whereupon identified staff with MRSA carriage are then subjected to decolonization regime, in an effort to control the outbreak. See details on decolonization method in the "*National IPC Guidelines for Acute Healthcare Facilities*".

CP-CRE refers to Carbapenemase producing-carbapenam-resistant *Enterobacteriales* resistant to imipenam and/or meropenam due to production of New Delhi metallo-ß-lactamase 1 (NDM-1), *Klebsiella pneumoniae* carbapenemase (KPC), or OXA-48–like carbapenemase (OXA-48), type carbapenemases (metallo B-lactamases) IMP, Verona integrin-encoded metallo B-lactamase (VIM). To provide a safe environment in the hospital, Isolation and cohorting of CP-CRE patients is recommended to prevent transmission within the facility.

Group rehabilitative activities can continue for MDRO patients. Therapy staff are to practice Contact Precautions as described earlier.

7.2 Recommendations

1. An MDRO prevention plan should be part of any IPC programme.
2. MDRO patients should be isolated or cohorted, where possible.
3. Contact precaution should be practiced for MDRO patients.

ANNEX A: QR CODE TO ACCESS THE NATIONAL IPC GUIDELINES FOR ACUTE HEALTHCARE FACILITIES

Available from:

https://www.moh.gov.sg/docs/librariesprovider5/default-document-library/national-infection-prevention-and-control-guidelines-for-acute-healthcare-facilities---2017.pdf

-----End of Guidelines-----