



INFECTION PREVENTION AND CONTROL PRACTICE HANDBOOK

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Any enquiries about or comments on this publication should be directed to:

Clinical Excellence Commission

Locked Bag 8

Haymarket NSW 1240

Phone: (02) 9269 5500

Email: CEC-HAI@health.nsw.gov.au

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Contributors

Jan Gralton, Iain Crawford, Evette Buono, Kate Callaghan, Ronald Govers, Nina Muscillo, Anne Aham, Paul Smollen, Paul Curtis - Clinical Excellence Commission

Jane Rothman - HAI Steering Committee, Clinical Excellence Commission

Catriona Furlong - Health Protection NSW

Amanda Elliott - Health and Education Training Institute

Nicky Gilroy - Agency for Clinical Innovation (BMT Network)

Kate Hipsley - NSW Ambulance

Bruce Sanderson - Central Coast LHD

Wendy Hamilton - Justice Health and Forensic Mental Health Network

Louise Bright, Alison Shoobert, John Ferguson - Hunter New England LHD

Beth Bint, Annmaree Wilson - Illawarra Shoalhaven LHD

Chris Fraser - Nepean Blue Mountains LHD

Leigh Boivin, Julie Hunt, Shayne Larymore - Northern Sydney LHD

Melanie Ison, Barbara May, Poonam Nagrani, Lindy Ryan - Mid North Coast LHD

Sharon Maher - Murrumbidgee LHD

Margaret Evans, Fiona Law, Kate Clezy - South Eastern Sydney LHD

Genevieve Maguire - Southern NSW LHD

Helen McCarthy, Jennifer Morrison, Donna Schmidt, Ravi Srinivas - South Western Sydney LHD

Margaret Barker, Marilyn Harris, Jeana Nurmeiyati, Helen Parker - Sydney LHD

Dianne Dalton - Sydney Children's Hospitals Network

Meegan Connors - Western NSW LHD

Kathy Dempsey, Jo Tallon, Tracey Worthington, Lyn Gilbert - Western Sydney LHD

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INTRODUCTION

Purpose

The purpose of this interim handbook is to provide practical, day-to-day guidance to support the implementation of the NSW Health [Infection Prevention and Control Policy](#), which establishes the infection prevention and control standards for NSW public health organisations (PHOs). This handbook should be read in conjunction with the most current version of the [Australian Guidelines for the Prevention and Control of Infection in Healthcare](#).

Relevant policies

This handbook complies with, and should be read alongside the most current versions of the following NSW Health Policy Directives and Guidelines (see Table 1).

Table 1. Relevant NSW policies to consider

NSW Health Policy or Guideline	PD/GL Number
Central Venous Access Device Insertion and Post Insertion Care	PD2011_060
Clinical and Related Waste Management for Health Services	PD2017_026
Code of Conduct	PD2015_049
Community Sharps Disposal by Area Health Services	PD2008_004
Environmental Cleaning Policy	PD2012_061
HIV, Hepatitis B and Hepatitis C - Management of Health Care Workers Potentially Exposed	PD2017_010
HIV, Hepatitis B or Hepatitis C - Health Care Workers Infected	PD2005_162
HIV - Management of People with HIV Infection Who Risk Infecting Others	PD2009_023
Hospital Response to Pandemic Influenza Part 1: Emergency Department Response	PD2007_048
Infection Prevention and Control Policy	PD2017_013
Influenza Pandemic Plan	PD2016_016
Influenza Pandemic - Providing Critical Care	PD2010_028
Maternity - Breast Milk: Safe Management	PD2010_019
NSW Contingency Plan for Viral Haemorrhagic Fevers	GL2016_002
Occupational Assessment, Screening and Vaccination Against Specified Infectious Diseases	PD2011_005
Oral Health: Cleaning, Disinfecting and Sterilizing	PD2013_024
Peripheral Intravenous Cannula (PIVC) Insertion and Post Insertion Care in Adult Patients	GL2013_013
Principles for the Management of Tuberculosis in New South Wales	PD2014_050
Sharps Injuries - Prevention in the NSW Public Health System	PD2007_052
Tuberculosis Contact Tracing	PD2008_017
Tuberculosis Management of People Knowingly Placing Others at Risk of Infection	PD2015_012
Work Health and Safety: Better Practice Procedures	PD2013_050
Work Health and Safety - Other Workers Engagement	GL2013_011

Definitions and Abbreviations

Terms and abbreviations listed in Table 2 have been defined at the level of detail required for understanding the content of this handbook. Definitions have been developed by expert consensus, with references provided where a definition has been obtained from another source.

Table 2. Table of Definitions and Abbreviations

Term	Definition
µm	Micrometre, also called a micron. A metric unit of measure for length, equal to 0.001 millimetres.
ABHR	Alcohol-based hand rub. An alcohol-containing preparation designed for reducing the number of viable microorganisms on the hands without the use or aid of running water. The product must meet the EN1500 testing standard for bactericidal effect and be included on the Australian Register of Therapeutic Goods as a medicinal product [1].
ACSQHC	Australian Commission for Safety and Quality in Health Care
Aerosol(s)	Very small lightweight particles that can remain suspended in the air for long periods and travel significant distances. Are generally < 5µm in diameter. Aerosols are formed from the evaporation of a larger droplet particle. Also referred to as 'droplet nuclei' [2, 3].
AGP	Aerosol generating procedure. Clinical procedures which are known to produce aerosols, such as suctioning, intubation, chest physiotherapy, nebuliser treatment or bronchoscopy.
Airborne precautions	A type of transmission-based precautions, used to interrupt airborne transmission from patients known or suspected to be infected with agents transmitted person-to-person by the airborne route [1].
Airborne transmission	Also known as the airborne route. Airborne transmission is a form of indirect transmission that occurs by the dissemination of small expelled aerosols (< 5µm) that can carry microorganisms.
Alert	Enabling of a communication warning flag that indicates current colonisation or infection in a patient's clinical records (see "Flagging", "De-flagging")
ANC	Absolute neutrophil count
Anteroom	A small room leading from a corridor into a room.
Antimicrobial	A chemical substance, usually a medicine, that inhibits or destroys bacteria, viruses, fungi, yeasts, moulds or protozoa [4].
Antimicrobial stewardship	An ongoing effort by a health service organisation to optimise antimicrobial use in order to improve patient outcomes, ensure cost-effective therapy and reduce adverse sequelae of antimicrobial use, including antimicrobial resistance [5].
ARTG	Australian Register of Therapeutic Goods

Aseptic technique	Aseptic technique consists of a set of specific practices and procedures performed under carefully controlled conditions. Aseptic technique protects patients during clinical procedures by utilising infection prevention measures that minimise the presence of microorganisms. While the principles of aseptic technique remain constant for all procedures, the level of practice will change depending upon a standard risk assessment [1].
Body substance	Any substance produced by, or otherwise expelled, excreted or extracted from the body.
CDI	<i>Clostridium difficile</i> infection. Develops in people taking antibiotics because antibiotics alter the normal enteric flora, either permitting the overgrowth of <i>C. difficile</i> or making the patient more susceptible to acquiring <i>C. difficile</i> . CDI will occur if <i>C. difficile</i> proliferate and produce toxins in the colon [6]. See Clostridium difficile information for clinicians [7] for further information.
CF	Cystic fibrosis
CLABSI	Central line associated bloodstream infection
Cleaning	The removal of visible soil (e.g. inorganic and organic material) from objects and surfaces and is normally accomplished manually or mechanically using water with detergents or enzymatic products [8].
Clearance	No evidence of current MRO colonisation determined by the retesting of patient samples and satisfaction of clearance screening criteria.
Clinical areas	Areas within a PHO where patient-related activity is expected.
Clinical waste	Waste which has the potential to cause sharps injury, infection or offence. When packaged and disposed of appropriately there is virtually no public health significance. Clinical waste contains the following types of waste: sharps, human tissues (excluding hair, teeth and nails), bulk body fluids and blood, visibly blood stained body fluids and visibly blood stained disposable material and equipment, laboratory specimens and cultures, animal tissues, carcasses or other waste arising from laboratory investigation or for medical or veterinary research [9]. Clinical waste does not include incontinence pads, drained dialysis wastes, sanitary waste or disposable nappies.
<i>Clostridium difficile</i>	A gram-positive, spore-forming, toxin-producing bacillus [10]. <i>C. difficile</i> is part of the normal intestinal flora in a small number of healthy patients and hospitalised patients [11].
Cohorting	The placement of patients who are infected or colonised with the same microorganism in the same zone [4]. As such, patients placed together under this circumstance may be referred to as a 'cohort'.
Colonisation	Detection of an organism from a site (usually skin, throat, nose or perineum, and/or chronic ulcers) that shows no sign of invasive infection.

Commensal Microorganism	Microorganisms living continuously on or within the body, without causing disease. May become a source of infection in specific circumstances, such as when the microbial population grows to excess or gains access to areas of the body outside its normal habitat.
Consumer	Members of the public who use, or are potential users of, healthcare services [12]. When referring to consumers and/or carers, this term includes patients, residents, clients, consumers, families, carers, and other support people.
Construction activity	Any activity relating to the demolition, construction, renovation, remodelling, reconstruction, repair or building maintenance of a PHO.
Contact	<ol style="list-style-type: none"> 1. The state or fact of touching or being in immediate proximity or association [13]. 2. An individual who may have been exposed to an infected person.
Contact precautions	A type of transmission-based precautions used to interrupt the transmission of infectious agents that are spread by direct or indirect contact with the patient or the patient's environment [1].
CPE	Carbapenem-producing Enterobacteriaceae. Refers to bacteria that are members of the family Enterobacteriaceae that have been identified to carry a carbapenemase gene and are therefore resistant to carbapenems.
Decolonisation	Treatment of colonised persons with antimicrobials and/or other measures to eradicate the colonising organism.
Decontamination	Use of a physical or chemical means to remove, inactivate or destroy pathogens on a surface or item so that they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use or disposal [1].
De-flagging	Removal of a communication warning flag or alert that indicates current MRO colonisation or infection in a patient's clinical records (see "Alert", "Flagging")
Disinfection	Reduction of the number of viable microorganisms on a product or item to a level previously specified as appropriate for its intended further handling or use [14].
Double cleaning	Cleaning procedure consisting of cleaning with neutral detergent followed with a TGA registered disinfectant e.g. bleach or hospital grade disinfectant. This process must involve either: a 2-step clean, which involves a physical clean using detergent solution followed by use of a chemical disinfectant; or a 2-in-1 clean in which a combined detergent/disinfectant wipe or solution is used and mechanical/manual cleaning action is involved [15].
Double packaging	Double packaging of specimens consists of a leakproof primary receptacle containing the specimen and leakproof secondary packaging with absorbent material to absorb the entire contents of the package [16].
Droplet(s)	Small particles, approximately 5 -100µm in diameter [2].


Droplet transmission	Droplet transmission is a form of direct transmission that occurs by the dissemination of expelled aerosols ($\geq 5\mu\text{m}$) that can carry microorganisms. Droplets travel directly from the respiratory tract of the infectious individual to the susceptible mucosal surfaces of the recipient, generally over short distances [3].
Droplet precautions	A type of transmission-based precautions used to interrupt droplet transmission occurring from patients known or suspected to be infected with agents transmitted by respiratory droplets [1].
Endemicity	Usual level or incidence of a microorganism in a particular healthcare setting.
EPP	Exposure prone procedure
ESBL	Extended-spectrum beta lactamase-producing enteric Gram-negative bacillus (Enterobacteriaceae).
Flagging	Enabling of a communication warning alert that indicates current colonisation or infection in a patient's clinical records (see "Alert", De-Flagging")
Fit check	A quick check to ensure that the respirator fits correctly each time it is put on [1].
FMT	Faecal microbiota transplantation.
Fomite	An inanimate object or surface that may become contaminated with microorganisms and serve in their transmission.
Gowning	The wearing of an impervious or fluid resistant apron or gown for personal protection as a barrier against blood, other body substances, contaminated items and or a contaminated environment.
HAI	Healthcare associated infection(s). Refers to infections acquired as a result of healthcare interventions. An HAI can be acquired as an inpatient or whilst receiving care as an outpatient or in the community.
Hand hygiene	A general term referring to any action of hand cleansing. Includes washing hands with the use of water, soap or a soap solution, either non-antimicrobial or antimicrobial, or applying a waterless ABHR to the surface of the hands (e.g. alcohol-based hand rub). When performed correctly, hand hygiene results in a reduction of microorganisms on hands [17].
HBsAg	Hepatitis B surface antigen. A serologic marker on the surface of the hepatitis B virus which can be detected in high levels in serum during acute or chronic hepatitis B.
HBV	Hepatitis B virus
HCV	Hepatitis C virus
HCW	Healthcare worker. In the context of this manual, this refers to staff working in a clinical setting of a public health organisation.
HEPA	High efficiency particulate air
HITH	Hospital in the Home

HIV	Human immunodeficiency virus
HSV	Herpes simplex virus
ICU	Intensive Care Unit
IgM	Immunoglobulin M
ILI	Influenza-like illness. The case definition of ILI is sudden onset of fever ($\geq 38^{\circ}\text{C}$) PLUS cough and/or other respiratory symptoms (e.g. shortness of breath) PLUS one or more systemic symptom/s (fatigue, muscle soreness, headache) [18]. A case of influenza meets the ILI case definition PLUS a positive laboratory test result for influenza.
Immunocompromised host	An individual who does not have the ability to respond normally to an infection (or other foreign antigen) due to an impaired or weakened immune system. This can be caused by inherited disorders (e.g. hypogammaglobulinaemia, severe combined immunodeficiency) or acquired disorders (e.g. diabetes, HIV infection, malnutrition and drugs).
Immunosuppression	Inhibition or suppression of the immune response. This can be either deliberate (e.g. as part of disease treatment or preparation for transplantation to avoid graft rejection) or as a side effect of therapy (e.g. as may occur with corticosteroid therapy or chemotherapy)
Infection	Infection is the invasion of a host organism's bodily tissues by microorganisms and their subsequent multiplication, resulting in disease-causing symptoms and the reaction of host tissues to these organisms and the toxins they produce.
Invasive device	A device which, in whole or in part, penetrates inside the body, either through a body orifice or through the surface of the body [19].
Invasive procedures	Procedures that require entry into tissues, cavities or organs or repair of traumatic injuries [1].
IV	Intravenous
IR	Interventional radiology
Key parts	Key parts are the sterile components of equipment used during a procedure e.g. bungs, needle hubs, syringe tips, dressing packs [20].
Key sites	Key sites include any non-intact skin and insertion or access sites for medical devices connected to the patient e.g. insertion/access sites of intravenous devices, urinary devices, open wounds [20].
Maintenance	The process of maintaining plant, equipment and building elements in their original condition [21].
MBL	Metallo-beta-lactamase
Medical examination gloves	Non-sterile medical examination gloves that meet the requirements of AS/NZS 4011:1997 <i>Single-use examination gloves - Specification</i> .
MHDA	Mental health, drug and alcohol
mm³	Cubic millimetre

Monitor	To check, supervise, observe critically, or record the progress of an activity, action or system on a regular basis in order to identify change.
MRO	Multi-resistant organism(s). A microorganism that has evolved, developed, or acquired mechanisms to limit the efficacy of multiple classes of antimicrobial agents. A MRO is resistant to at least three antimicrobial classes.
MSSA	Methicillin-susceptible <i>Staphylococcus aureus</i> .
MRSA	Methicillin-resistant <i>Staphylococcus aureus</i> . A strain of <i>S. aureus</i> that is resistant to beta-lactam antibiotics including penicillins and cephalosporins.
Neutropenia	Abnormally low count of neutrophils. Neutropenia in adults is defined as an ANC $<0.5 \times 10^9/L$, or with or less than $1.0 \times 10^9/L$ and predicted to fall lower than $0.5 \times 10^9/L$ [22]. Severe, or profound, neutropenia is defined as an ANC $\leq 0.01 \times 10^9/L$ [23].
NHMRC	National Health and Medical Research Council
NICU	Neonatal Intensive Care Unit
NSQHS Standards	National Safety and Quality Health Service Standards. A national quality assurance mechanism to assess whether minimum standards of safety and quality are met by healthcare facilities.
Outbreak	A state characterised by an incidence of an infection greater than what is typically expected in a particular healthcare setting.
P2/N95 mask	A close fitting mask worn for airborne precautions, which is capable of filtering $0.3 \mu m$ particles. A P2 respirator must comply with AS/NZS 1716:2009.
Patient Surroundings (AKA Patient Zone)	<p>The space temporarily occupied by an individual patient and the items within it. This will vary between settings and will contain:</p> <ol style="list-style-type: none"> 1. Surfaces frequently touched by the patient occupying that space (eg. bed, bedside table, chair, personal belongings); and 2. Surfaces frequently touched by the staff member providing patient care (e.g. monitors, knobs). <p>Patient surroundings will vary with the patient setting. For example:</p> <p><u>Hospital Inpatient Setting</u></p> <p>The patient surroundings will include items such as the patient's bed, bedside table, bed linen, monitors, other medical equipment and personal belongings kept at the patient's bedside. The patient observation charts (and health care record) are:</p> <ul style="list-style-type: none"> • part of the patient surroundings if, for example, they are on the end of the patient's bed • not part of the patient surroundings if, for example, they are kept outside the door to the patient's room.

	<p>Patient surroundings do not include curtains, partitions and doors between separate patient areas.[24]</p> <p><u>Operating Theatre</u> The patient surroundings will include, for example, the top of the operating table, arm board, and anaesthetic machine and trolleys.</p> <p><u>Office Based Care e.g. clinics or hospital outpatient setting</u> The patient surroundings will usually include any procedural trolleys used and the examination table if the patient sits/lies on it.</p> <p><u>Patient's Home</u> The patient surroundings may include all items in the patient's home including medical equipment.</p>
PCR	Polymerase chain reaction
PHO	Public Health Organisation(s). This term refers to Local Health Districts, statutory health corporations or an affiliated health organisation in response to its recognised establishments and recognised services, as defined in the <i>Health Services Act 1997</i> .
PHU	Public Health Unit
PICC	Peripherally inserted central catheter
Point of Care	<p>The place where</p> <ul style="list-style-type: none"> • the patient • the staff member • care or treatment involving touching the patient and/or his/her surroundings come together.[24] <p>An ABHR must be easily accessible and as close as possible – preferably within arms-reach of where patient care or treatment is taking place. In the hospital environment it will be in places including attached to the patient's bed, but in other contexts it could be in a treatment room, cot, chair, ambulance, carried on the staff or in a patient's home.</p>
PPE	Personal protective equipment. Refers to a variety of infection prevention and control barriers and respirators used alone, or in combination, to protect mucous membranes, skin, and clothing from contact with recognised and unrecognised sources of microorganisms in healthcare settings.
Pre-operative load reduction	Use of topical or systemic antibiotics to reduce <i>Staphylococcus aureus</i> colonisation or infection prior to surgical procedures.
Procedure room	A room designated for the performance of invasive procedures which does not require a restricted environment but may require the use of sterile instruments or supplies. Moderate sedation, minimal sedation and local anaesthesia may be administered in a procedure room [25].

Protective environment	A specialised patient care area, usually in a hospital, with a positive airflow relative to the corridor (i.e., air flows from the room to the outside adjacent space). The combination of HEPA filtration, high numbers of air changes per hour (>12), and minimal leakage of air into the room creates an environment that can safely accommodate patients who have undergone allogeneic hematopoietic stem cell transplant [26].
Protective eyewear	Refers to goggles, face visors or face shields.
Protective isolation	A range of practices used to protect highly susceptible patients from infection. These practices may include: physical separation from the main hospital or ward population (typically in a standard single room), measures to prevent the exogenous acquisition of microorganisms (e.g. hand hygiene), restrictions placed on movement, visitors and diet, antimicrobial prophylaxis and selective decontamination of the digestive system, and supportive care to maintain the integrity of skin and mucous membranes, including skin, oral and dental care [27].
RACF	Residential aged care facility
Rehabilitation	Rehabilitation care in NSW is defined as the provision of care that aims to: restore functional ability for a person who has experienced an illness or injury; enable regaining function and self-sufficiency to the level prior to that illness or injury within the constraints of the medical prognosis for improvement; and develop functional ability to compensate for deficits that cannot be medically reversed [28].
Risk assessment	The review of a patient or clinical situation to determine risk of adverse consequences.
Risk management	Actions implemented to minimise or control risk.
Reprocessing	All of the activities required to ensure that a used, reusable medical device is safe for its intended purpose. This is a multi-step process that includes cleaning, inspection and assembly, functional testing (if applicable), disinfection (if applicable), packaging and labelling and sterilization (if applicable) [14].
RMD	Reusable medical device
SAB	<i>Staphylococcus aureus</i> bacteraemia
Screening	Microbiological testing, for the purpose of detection of multi-resistant organisms within a patient or population. By intent, screening is different to clinical diagnostic testing that is used in the setting of suspected infection.
Semi-critical sites	Sites that have an increased susceptibility to infection e.g. mucosal membranes or non-intact skin.
Sentinel event	Events that occur infrequently and may warrant further investigation into whether routine infection control practices and procedures are in place and working adequately, for example, unexpected deaths or unanticipated serious or psychological harm (or risk thereof) due to infection.

Sharp(s)	Any object capable of inflicting a penetrating injury, which may or may not be contaminated with blood and/or body substances. This includes needles and any other sharp objects or instruments designed to perform penetrating procedures.
Sharps container	A receptacle for the disposal of sharps, designed to meet AS/NZS 4031:1992 and AS/NZS 4261:1994.
Single patient use equipment	Equipment to be used for one patient only. Single patient use equipment should not be used on more than one patient.
Single use equipment	Equipment to be used on a single occasion for one patient only and then discarded after use. Single use equipment should not be reused on the same patient or any other patient. Single use equipment is labelled with this symbol: 
Social Contact	Any form of physical contact resulting from non-clinical, everyday interactions with others (e.g. handshaking, hugging etc.)
spp.	Species
Standard precautions	Standard precautions represent the minimum infection prevention measures that apply to all patient care, regardless of suspected or confirmed infection status of the patient, in any setting where healthcare is delivered. These evidence-based practices are designed to both protect healthcare personnel and prevent the spread of infections among patients [29].
Sterile	Free from all living microorganisms, usually described as a probability (e.g. the probability of a surviving microorganism being 1 in 1 million) [8].
Sterile gloves	Sterile gloves that meet the requirements of AS/NZS 4179:2014.
Sterilization	A validated process used to render a product free from viable microorganisms [14].
Stock	Medical consumables
SSI(s)	Surgical site infection(s)
Susceptible	Likely or liable to be influenced or harmed by a particular thing [30].
TB	Tuberculosis
Teach back	Asking patients to explain in their own words what they need to know or do. It is a chance to check understanding and re-teach information if needed. Teach back is not a test of the patient, but of how well the clinician explained a concept [31].
Terminal clean	Double cleaning of a room following transfer or discharge of a patient where transmission-based precautions were required [15].
TGA	Therapeutic Goods Administration
Transmission	Movement of microorganism(s) from a colonised or infected individual, contaminated surface or vector to a susceptible individual.

Transmission-based precautions	Additional work practices in situations where standard precautions alone may be insufficient to prevent transmission of infection [1].
Triple packaging	Triple packaging of a specimen consists of a leakproof primary receptacle, leakproof secondary packaging with absorbent material to absorb the entire contents of the package and outer packaging that has secure closure [16].
Type 5/Class N room	A Class N/Type 5 isolation room is a single room with an ensuite that is not shared. It is used for patients who require isolation to reduce airborne transmission of disease (e.g. varicella, measles, pulmonary or laryngeal tuberculosis) [32].
VHF(s)	Viral haemorrhagic fever(s)
VRE	Vancomycin-resistant enterococcus. A strain of <i>Enterococcus</i> , a typical gut bacterium that displays resistance to vancomycin. VRE is an opportunistic microorganism that may cause infection in ICU patients (IV line-associated sepsis, intra-abdominal infection and urinary tract infection), neutropenic and other haematology patients (IV line-associated sepsis) and bacteraemia associated with mucositis or enteritis and in solid organ transplant patients. For further information, see Section 7 , <i>Risk Mitigation: Precautions for Multi-Resistant Organisms and Clostridium difficile</i> .
VZV	Varicella Zoster Virus
WHO	World Health Organization

SECTION 1

HEALTHCARE ASSOCIATED INFECTIONS

1.1 The risk of healthcare associated infections

‘Along with medication errors, hospital acquired infections cause a great many deaths and illnesses within our hospitals’.

Peter Garling SC, Final Report of the Special Commission of Inquiry, Acute Care Services in NSW Public Hospitals, 2008

Healthcare associated infections (HAIs) are the most common complication affecting patients in healthcare settings. The literature suggests that at least 5.9% of hospital visits are affected by HAIs [33]. Patients, visitors and healthcare workers (HCWs) are all at risk of acquiring a healthcare associated infection (HAI). HAIs are not limited to patients receiving care in a hospital - those receiving healthcare in community or home-based settings are also at risk.

Case study 1: Kevin’s story - an all too common story

Kevin, a 58 year old builder, presented to the emergency department of a local hospital with a history of self-resolving episodes of confusion, dizziness and impaired memory over the course of a few weeks. Kevin’s wife convinced him to go to the hospital after he had another, rather severe, episode of dizziness and limb weakness whilst at work on a building site.

*Kevin was admitted to hospital and underwent numerous investigations with a subsequent diagnosis of transient ischaemic attack. Kevin was started on medication and having experienced no further neurological symptoms over the weekend, he was declared medically fit to return home. On the intended day of discharge (day 5), Kevin developed rigors and was found to be febrile, dyspnoeic and tachycardic. Methicillin-susceptible *Staphylococcus aureus* (MSSA) was cultured from his blood.*

Kevin was referred to an infectious diseases physician for management of his MSSA bacteraemia, which required two weeks of IV antibiotics in hospital, followed by another four weeks via the hospital-in-the-home service. Kevin’s recovery was complicated and, due to his infection and other stressors, Kevin was at an even higher risk of further ischaemic events (such as a stroke), which was very distressing for his wife. Although he did eventually recover, Kevin was unable to return to work until four months after his initial presentation to hospital.

Potentially any microorganism may cause a HAI. A common misconception is that HAIs are caused only by multi-resistant microorganisms (MROs), such as methicillin-resistant *Staphylococcus aureus* (MRSA). HAIs can be caused by any bacteria, fungi, viruses, parasites and prions. Examples of microorganisms that cause HAIs include *Pseudomonas* spp., *Enterobacteriaceae* spp., *Clostridium difficile*, *Acinetobacter* spp., *Candida albicans*, norovirus and influenza virus.

A HAI may occur in the presence or absence of an invasive procedure or device, and acquisition of a HAI is associated with greater morbidity and mortality risks. The literature reports:

- 3% of surgical procedures result in an infection [34];
- HAIs prolong the length of a patient’s hospitalisation by an average of 10 days [35];
- The type of HAI and the microorganism involved influences the duration of additional hospitalisation required:
 - A post-operative *C. difficile* infection (CDI) will prolong hospitalisation by an average of 9 days [36]
 - Surgical site infections prolong hospitalisation by an average of 10 days [37]

- Bloodstream infections can prolong hospitalisation by up to 12 days [38]
- 30% of patients with a HAI are likely to be readmitted to hospital within 12 months [39];
- Intensive care unit (ICU) patients with a bloodstream infection are 2-3 times more likely to die than ICU patients without a bloodstream infection [38]; and
- A patient's risk of mortality is at least three times greater if a HAI is acquired [34, 40].

HAIs are preventable. New South Wales (NSW) Public Health Organisations (PHOs) and their HCWs have an ethical and professional obligation to do no harm to the patients in their care. This includes ensuring that patients do not acquire a HAI during their healthcare encounter. Implementing and adhering to infection prevention and control strategies to avoid the transmission of microorganisms is a crucial step in fulfilling this obligation.

1.2 Modes and routes of transmission

A mode of transmission describes how a microorganism moves between individuals. Transmission can either occur vertically, from mother to child, or horizontally, between individuals who are not necessarily related. In horizontal transmission, microorganisms will use either a direct or indirect mode of transmission to leave the current host and colonise the next host. Routes of transmission may involve direct contact, indirect contact, droplet, airborne and/or vector-borne routes.

1.2.1 Contact transmission routes

Contact transmission routes refer to the movement of microorganisms from a colonised or contaminated source to a susceptible host, via either direct or indirect physical contact.

Direct contact transmission involves skin-to-skin contact and the physical transfer of microorganisms directly from one person to another person. This may occur between a colonised HCW and patient when the HCW is performing patient care activities that require physical contact. A visitor or another patient may also initiate direct contact transmission with a patient during handshaking and hugging and other forms of personal social contact.

Patients may infect themselves when touching wound sites or mucosal membranes with hands colonised with commensal microorganisms or contaminated by body substances that contain microorganisms (e.g. blood, respiratory secretions).

Indirect contact transmission involves the initial transfer of microorganisms from a host individual to an intermediary object and then subsequent transfer to another individual. The hands of HCWs are common mediators of indirect contact transmission [41-43], due to contact with fomites and the environment. Reusable medical devices that are inadequately reprocessed between patients are also implicated in the indirect contact transmission of microorganisms to patients [44, 45].

AS/NZS 4187:2014

Reprocessing of reusable medical devices in health service organizations

AS/NZS 4815:2006

Office-based health care facilities - Reprocessing of reusable medical and surgical instruments and equipment, and maintenance of the associated environment

Refer to [Section 8](#),

Reprocessing for further advice

1.2.2 Droplet transmission route

Droplet transmission involves large droplets carrying microorganisms from a colonised or infected individual, often produced by coughing, talking and breathing [46, 47].

Due to their size, large droplets can only travel very short distances (≤ 1 metre) before either settling and contaminating surfaces [2] or making contact with and potentially infecting the mucosal surfaces

of susceptible individuals. Therefore droplet transmission requires close contact between the colonised or infected host and other susceptible individuals.

1.2.3 Airborne transmission route

Airborne transmission is a form of indirect transmission that occurs by the dissemination of small expelled aerosols that can carry microorganisms. Aerosols are much smaller than droplets and are often produced by coughing, talking and breathing [47] as well as during clinical aerosol generating procedures (AGP) such as suctioning, intubation and chest physiotherapy [48]. Such aerosols can travel long distances and can remain suspended in the air for prolonged periods of time.

1.2.4 Common source route

Common source transmission is the spread of microorganisms from a single source. This is often facilitated by the contamination of food or water and is best illustrated by institutional foodborne outbreaks.

1.2.5 Simultaneous transmission routes

There are certain microorganisms that simultaneously employ multiple transmission routes. For example, norovirus can be spread by direct contact, indirect contact, droplet transmission and common-source transmission through contaminated food.

Case study 2: Reece's story - a tale of transmission

A nine year old boy, Reece, presented to the hospital's emergency department with abdominal cramping, continuous vomiting and a headache. Reece's mother told the triage nurse that Reece had started vomiting two hours ago. The medical officer recorded the observation of 'projectile vomiting'. The medical officer put in a lab order for a stool specimen to test for norovirus. Reece was admitted to the paediatric ward for monitoring and rehydration.

Reece was placed in a single room on the unit. He continued to vomit on and off throughout the afternoon. To take his mind off his illness, his mother let Reece play games on her tablet device. The lab results confirmed the boy had norovirus. Once Reece was asleep, his mother, Lea, went to the tea room and watched some TV with the other parents. During this time Lea showed Abdul, another parent, a book she had downloaded onto the device. Afterwards, Abdul returned back to his daughter's room, located elsewhere in the unit, to feed his daughter, Neya. Neya had already been in hospital for 4 days.

24 hours later, Neya complained of stomach cramps and started vomiting. Neya was later diagnosed with norovirus and found to have the same strain that was found in Reece's stool specimen.

What happened?

Reece contaminated the tablet device with norovirus via droplet and contact routes. When Abdul later used the tablet, his hands became contaminated with norovirus through the indirect contact route. When he returned to Neya's room, he fed Neya without performing hand hygiene and through indirect contact route, Abdul transferred norovirus to her.

How could this have been prevented?

Reece should practise hand hygiene after going to the toilet and vomiting. Personal effects, including tablet devices and toys, should not be shared between patients and should be regularly cleaned. Everybody, including visitors and carers, should clean their hands before and after contact with a patient, equipment or the surrounding environment.

1.3 Colonisation

Microorganisms are normally found on the skin surface, in the nasopharynx and in the human gut, and cause no harm to their human host when colonised in these usual anatomical locations. This is called colonisation of commensal microorganisms.

The commensal microorganisms of one person may be a pathogen for another person. Patients exposed to HCWs and visitors may be at risk of acquiring an infection from these colonised individuals depending on the extent of exposure and their own immune status. A patient may be visited up to 18 times per hour by HCWs or visitors. At least 27% of these visits involve physical contact. Therefore, there are plenty of opportunities for patients to be exposed and infected by microorganisms innocuously carried by HCWs and visitors [49].

Colonisation in itself is not harmful and does not require treatment.

1.4 Infection

Infection may be preceded by colonisation. An infection is typically differentiated from colonisation by the presence of clinical signs and symptoms. There may be a systemic response (e.g. febrile illness, elevated white cell count) and/or a local response (e.g. cough, localised inflammation). Infection in certain individuals may not be easily observable. For example, infected individuals who are elderly and/or immunocompromised may be unable to mount a strong clinical response to infection.

During most infections, an asymptomatic phase will precede the onset of symptomatic clinical illness. Depending on the causative microorganism, an individual may also shed infectious material during asymptomatic infection. As an example, the influenza virus is shed prior to the onset of flu symptoms [50]. If the patient is immunocompromised, pregnant or is undergoing certain surgical procedures, having an asymptomatic infection may pose a significant clinical risk to the patient [51, 52].

[Clinical Practice Guidelines](#)
Antenatal Care - Module 1

An infection may be considered to be latent whereby the infection is dormant; the infection may or may not reactivate at a later stage. An individual with a latent infection is not clinically unwell and does not usually shed infectious material during the latent phase. Reactivation of the infection is often triggered by the waning of the immune response. Latent infections are often associated with tuberculosis, hepatitis B virus and varicella-zoster virus.

[NSW Health Factsheet:](#)
Tuberculosis

[NSW Health Factsheet:](#)
Hepatitis B

[NSW Health Factsheet:](#)
Chickenpox

SECTION 2

CLINICAL GOVERNANCE

'What is meant by a clinical governance framework is a set of initiatives designed to enhance care, and the promotion of a productive culture and climate within which care can thrive.'

Braithwaite & Travaglia 2008 [53]

Clinical governance refers to a system through which health organisations are accountable for continuously improving the quality of their services and safeguarding high standards of care, which includes the prevention of HAIs, by creating an environment in which excellence in clinical care will flourish [54, 55].

Clinical governance accountabilities for infection prevention and control include:

- Executive engagement and clearly defined leadership;
- Implementation, reporting and evaluation of a local HAI prevention program;
- Increasing consumer participation and education for infection prevention and control;
- HAI and antimicrobial stewardship surveillance; and
- Where relevant, inclusion and consultation with non-acute healthcare services in the HAI prevention program.

[NSQHS Standard 3.3](#)

Developing and implementing systems and processes for reporting, investigating and analysing healthcare associated infections, and aligning these systems to the organisation's risk management strategy.

[NSW Health PD2014_004](#)

Incident Management Policy

The local HAI program is an integral component of each PHO's clinical governance system and should be regularly evaluated. Evaluation findings should be used to update the PHO's risk management plan. The NSW Health Incident Management System (IMS) should be used to record incidents.

2.1 National standards

The National Safety and Quality Health Service (NSQHS) Standards are a quality assurance mechanism aimed at protecting patients from harm and improving the quality of health service provision [12]. Standard 1 highlights the fundamental organisation requirements for all clinical service delivery. Specifically for infection prevention and control, the requirements are:

- The organisational structure defines the roles and responsibilities of managers and clinicians for infection prevention and control
- As part of a clinical governance framework appropriate governance committees and reporting lines are established and these must include an Infection Prevention and Control (IPC) committee, which reports to a peak health care quality committee.
- IPC outcomes and processes are audited, monitored and reported by the IPC committee through to the peak health care committee.
- Appropriate policies, procedures and guidelines for effective IPC are appropriately managed, up-dated and readily available to clinicians.
- All staff are appropriately trained, educated and credentialed as necessary for infection prevention and control practices.
- Systems are in place to identify and manage risk related to IPC.

[NSQHS Standard 1](#)

Governance for Safety and Quality in Health Service Organisations

[NSQHS Standard 3](#)

Preventing and Controlling Healthcare Associated Infections

Key to this handbook is Standard 3 ‘Preventing and Controlling Healthcare Associated Infections’. This Standard sets out the minimum requirements for the prevention and management of healthcare associated infections. Alignment with relevant NSQHS Standard 3 criteria is identified in the side margin. The [NSQHS Hospitals Accreditation Workbooks](#) [56] provide further information on the NSQHS Standards.

2.2 Risk management framework

The local IPC program should use a risk management framework consistent with NSW Health policy. For IPC, the risk framework for PHOs should address five key actions of the NSW Health Risk Management Framework [57] described in Figure 1.

[NSW Health PD2015_043](#)
Risk Management - Enterprise-Wide
Risk Management Policy and
Framework - NSW Health

[Australian Guidelines for the
Prevention and Control of Infection
in Healthcare](#)

A2.1 Risk management basics

Figure 1. Steps of risk management, based on the NSW Health Risk Management Framework^[57]

1. ESTABLISH THE CONTEXT

Consider: *What sort of setting am I working in?*
Who else is in this setting?
What sort of clinical procedures are occurring here?

2. IDENTIFY INFECTION RISKS

Consider: *Is there a risk that this could lead to an infection in a patient, staff member
or visitor?*
Is anyone in this setting particularly susceptible to an infection?

3. ASSESS THE RISK OF INFECTION

Consider: *What is the likelihood of infection occurring in a susceptible person in this
setting?*
How serious is the risk of infection to the patient, staff or visitor?

4. CONTROL THE RISK OF INFECTION

Consider: *How is this infection spread?*
*Can we eliminate the risk of infection and, if not, how can we minimise the
spread of infection?*

5. REVIEW EFFECTIVENESS OF CONTROL MEASURES

Consider: *How effective were the risk controls?*

Case study 3: Hospital with high *Staphylococcus aureus* Bacteraemia (SAB) rate

Regular performance monitoring at St Elsewhere Hospital revealed a higher than benchmark SAB rate over the preceding six months. The Infection Prevention and Control (IPC) Committee undertook a risk assessment to determine the appropriate management strategies.

1. Establish the context

- A major metropolitan tertiary referral hospital with a regional cancer care service.
- Significant trauma service.
- There was significant re-development of the cancer care services.
- A significant staff turnover.

2. Identify infection risks

- Significant patient risk of infection associated with the trauma and cancer care service.
- A large number of patients have central lines in place.
- Many patients are immunocompromised.
- IPC service regularly monitors SAB rates and vascular access device use.
- Redevelopment included demolition and service disruption.
- High turnover of staff may have impacted on staff training.

3. Assess the risk of infection

- Determine the type, source, location and significance of the infections.
- Determine the number of patients with intravenous access devices and their use and infections.
- Establish what controls are currently in place and are they effective. Review audits of vascular access device insertion, use and care and compliance with policy and procedures.
- Identify if the risk is in a particular patient population.
- Determine causal and infection risks posed by demolition and reconstruction.

4. Control the risk of infection

- Discuss the risk of infection with appropriate clinical groups.
- Quality improvement program to improve compliance with vascular access device procedures and infection control processes.
- Provide education and credentialing for the insertion of vascular access insertion.
- Review processes for the care of vascular access devices.

5. Review the effectiveness of control measures

- Continue to monitor SAB rate.
- Audit processes for the insertion, management and removal of vascular access devices.
- Ensure reporting to IPC and peak quality committees.
- Provide feedback to HCWs.

2.3 Infection prevention and control program

Every PHO is to have an infection prevention and control program in place. The success and effectiveness of such a program requires the development and involvement of suitably qualified personnel or the development of adequate systems to link in with such expertise.

[NSQHS Standard 3.1](#)

Developing and implementing governance systems for effective infection prevention and control to minimise the risks to patients of healthcare associated infections

In line with the recommendations of the World Health Organization (WHO) [58], each PHO should have an infection prevention and control program that, as a minimum, addresses:

- Governance of infection prevention and control within the organisation;

- Identification and management of infection risks in patients and in the healthcare environment;
- Local surveillance of infectious diseases (e.g. contact tracing notification of scheduled conditions to the Public Health Unit) and targeted surveillance of HAIs;
- Assessment of compliance with best practice infection prevention and control standards;
- Facilitation of consumer engagement and management of public profile with regard to infection prevention and control;
- Production of local policies, guidelines, procedures and protocols;
- Economic feasibility and cost-effectiveness of infection prevention and control strategies;
- Human resource issues, such as infection prevention and control orientation and training;
- Liaison with local clinical microbiology services;
- Relationships with other relevant services and committees, such as waste management, biosafety, antimicrobial pharmacy, work health and safety and consumer participation; and
- Monitoring, evaluation and reporting of the program.

2.3.1 Roles and responsibilities of the healthcare worker

Everyone who works in a PHO has a responsibility to embrace the infection prevention and control principles to do no harm and, therefore, prevent and control infection in the healthcare setting.

[NSW Health PD2015_035](#)
NSW Health Code of Conduct

Infection prevention and control is incorporated into the work practices of all clinical and non-clinical HCWs. Each HCW is accountable for the inclusion of infection prevention and control in the work they do. In addition, each HCW is also ethically accountable for the inclusion of infection prevention and control in any work they witness which is carried out by other HCWs.

2.4 Preventative maintenance and asset management

Each PHO is responsible for developing and carrying out its own maintenance and asset management strategy to meet the needs of the PHO and the population it serves. This strategy must include consideration of the infection prevention and control implications of purchasing and maintaining plant and equipment and the construction and maintenance of buildings.

[NSW Health Strategic Asset Management Plan](#)

2.4.1 Purchasing new equipment

Infection prevention and control, and where relevant, reprocessing advice should be obtained before the purchase of any new consumables or equipment. Advice should be based on an assessment of whether:

- the product will increase or decrease the risk of infection to the patient or other individuals who may be present during the delivery of care;
- the product may be implicated in the transmission of infection over time (e.g. corroding materials);
- the use of the product will have infection prevention and control implications for other consumables, equipment or plant;
- the feasibility of the cleaning and reprocessing requirements for the product will impact on product functionality and safety;
- additional infection prevention and control and/or reprocessing training is required for individuals who will be handling new product;

[NSW Health PD2014_005](#)
Goods and Services
Procurement policy

[NSW Health PD2010_035](#)
Process of Facility Planning

- alternative products are available and whether these other products present a lower risk of infection; and
- the product is registered with Therapeutic Goods Administration (TGA) or an exemption from TGA is obtained.

2.4.2 Review and maintenance of existing equipment

Each PHO should undertake regular maintenance and routine review of all patient and non-patient care equipment, furnishings and fixtures at least annually. Results of the review should always be reported back to infection prevention and control and, where necessary, involve the local infection prevention and control unit in any further investigations.

[NSW Health PD2015_008](#)

Water - Requirements for the Provision of Cold and Heated Water

2.4.3 Demolition, refurbishment and construction

The local infection prevention and control unit should be involved in the planning and building stages of any demolition, refurbishment and construction activity.

[NSW Health GL2008_017](#)

Health Facility Guidelines - Australasian Health Facility Guidelines in NSW

During the planning stage, the local infection prevention and control unit should be allowed to identify opportunities to prevent the transmission of infectious organisms during construction activity and identify opportunities to implement engineering and environmental controls for better infection prevention and control in any facility that will be built, renovated or repaired.

[Australasian Health Facility Guidelines](#)

Part D Infection Control

The infection prevention and control implications of preserving any existing structures during a refurbishment should also be considered and assessed for infection risks as part of the planning process.

Prior to any demolition, refurbishment and construction activity, the PHO should appoint IPC and clinical microbiology to the team that determines and evaluates:

[NSW Health PD2015_008](#)

Water - Requirements for the Provision of Cold and Heated Water

- the risk of airborne dissemination of microorganisms during construction activity;
- whether any environmental or air sampling is required and, if required, how sampling will be undertaken;
- the infection prevention and control requirements of the new, renovated or repaired facility;
- whether additional infection prevention and control measures are required for patients, HCWs and visitors during construction activity;
- what infection prevention and control measures are required by construction workers during construction activity; and
- the involvement of the local infection prevention and control unit in site inspections and commissioning of the new or refurbished facility.

Building contractors, engineers and any other individuals involved in construction activity should comply with infection prevention and control requirements, as determined locally, when on site. A notification and remediation process should be implemented to address any breaches in infection prevention and control that have arisen during construction activity.

2.5 Staff health and HAI risk

HCWs are potential sources of organisms in healthcare settings [59-63]. HCWs carry their own commensal microflora and at times may become colonised or infected with other microorganisms that are in circulation within a healthcare facility [64]. PHOs have a responsibility to take a proactive position on staff health matters that may put the health of patients, visitors or other HCWs at risk of a HAI. A HCW diagnosed with an infectious condition is obliged to practise in such a manner that does not put patients, visitors or other HCWS at risk of infection.

[NSW Health PD2015_049](#)
Code of Conduct

2.5.1 Risk assessing HCWs

There are times when the HCW may be the source of an infection and may promote the transfer of microorganisms to patients or to other HCWs. Where a HCW is unwell, ask the following questions prior to the delivery of any patient care to establish the presence and severity of this risk:

- Is the HCW known or suspected of being colonised or infected with an MRO or other infectious disease such as a blood-borne virus, influenza, pertussis, shingles or measles?
- Has the HCW recently received or currently taking antimicrobials?
- Is the HCW coughing and/or has fever?
- Is the HCW vomiting or has diarrhoea?
- Does the HCW have any open wounds?
- Is there a history of recent overseas travel or overseas hospitalisation? (see Table 7)
- Is performance of an exposure prone procedure (EPP) likely?

At other times, the HCW may be a susceptible host and may be at risk of acquiring an infection. To establish whether the HCW is susceptible to infection, clinicians should consider the following risk factors prior to patient exposure:

- **Procedures that are being performed by the HCW.** EPPs and aerosol generating procedures (AGPs) may increase the likelihood of microorganisms being transferred from patient to HCW.
- **Presence of wound, ulcers, burns, contact dermatitis or exfoliative skin conditions.** Skin is a physical defence against infection. Breaches to the skin provide an access portal for infection.
- **Co-morbidities.** Certain conditions or behaviours, e.g. smoking, may impair the immune response and increase the propensity for infection.
- **Pregnancy.** Acquisition of infections during pregnancy may have severe outcomes for the mother and/or foetus.
- **Contacts and exposure to particles carrying infectious material.** Consider whether the HCW has had exposure to a patient with infectious illness or exposure to symptoms of infectious disease (e.g. vomit, diarrhoea).
- **Vaccination.** Prior vaccination may protect the HCW from the establishment of infection. In some cases vaccination may also reduce the severity of illness.

The PHO must have systems to ensure compliance with the Policy Directives specified above. Where a PHO identifies, or is made aware, that a HCW is at risk or poses an infection risk to patients, visitors or other HCWs, the level of infection risk should be assessed using the framework set out above. The duty of care required should then be reviewed against the level and consequences of the infection risk. If the level of the risk is

[NSW Health PD2011_005](#)
Occupational Assessment,
Screening and Vaccination
Against Specified Infectious
Diseases

deemed unacceptable, the HCW must be managed in such a way to ensure that the health and welfare of the HCW or patients, visitors or other HCWs is not compromised.

2.5.2 Managing HCWs

The best practice for mitigating the risk of transmission to and from HCWs involves:

- The use of established lines of communication between HCWs and their managers and local staff health services; and
- A suitable management escalation process.

The implementation of these will require continual support and reinforcement at the PHO Executive level.

Where a HCW has notified their manager and/or staff health services of a suspected or known infection risk posed by their own health, a timely assessment of the HCW's condition should be undertaken and a suitable management response enacted. In some instances, a suitable management response may involve a change in duties, temporary leave or relocation until such time as the infection risk has been deemed acceptable or eliminated.

At all times, staff health information must be treated in confidence by managers and staff health services. The PHO must investigate and act further if it becomes aware that a HCW has unknowingly posed an infection risk to patients and other HCWs in the past.

Managers and staff health services also have a responsibility to minimise the risk of infection to HCWs.

If a HCW is immunocompromised or lacks sufficient protection against a vaccine preventable disease, a suitable management response may be to change the HCW's duties or place the HCW in an area where there is a lower risk of infection. HCWs should be made aware of infection risks prior to any anticipated exposure and be trained to use any required precautions. If an exposure is known to have occurred, depending on the nature and extent of exposure (e.g. penetrating needlestick injury), the exposed HCW may require immediate clinical care and treatment.

If a HCW is exposed to an infectious disease during the course of their work (e.g. caring for an infected patient), the management response should address:

- Notifying the HCW of the exposure (if they are unaware);
- Whether the HCW requires clinical assessment;
- Whether post exposure prophylaxis should be administered;
- Precautions to be undertaken by the HCW to prevent further spread of the disease (including time off work and return to work plan);
- Whether change of duties or home quarantine is required;
- Whether the Public Health Unit (PHU) and/or WorkCover needs to be notified; and
- Referral to a relevant specialist.

[NSW Health PD2014_028](#)

Open Disclosure Policy

[NSW Health PD2013_050](#)

Work Health and Safety:
Better Practice Procedures

[NSW Health PD2013_006](#)

Injury Management and
Return to Work

[NSW Health PD2011_005](#)

Occupational Assessment,
Screening and Vaccination
Against Specified Infectious
Diseases

[NSW Health PD2014_029](#)

Leave Matters for the NSW
Health Service

[NSW Health PD2017_010](#)

HIV, Hepatitis B and
Hepatitis C - Management of
Health Care Workers
Potentially Exposed

[NSW Health PD2005_162](#)

HIV, Hepatitis B or Hepatitis
C - Health Care Workers
Infected

[NSW Health GL2016_002](#)

NSW Contingency Plan for
Viral Haemorrhagic Fevers

In the event of a HCW being exposed to or infected with an infectious disease during the course of their work and being required to take leave from work by the PHO, a return to work program should be agreed to in consultation with the HCW. Likewise, a consultative process, involving the HCW, should be undertaken regarding any change in duties or temporary or longer term relocation.

2.5.3 Exposure prone procedures (EPPs)

EPPs are a subset of invasive procedures in body cavities, or in poorly visualised or confined sites (e.g. mouth), where there is potential for contact between the skin of the HCW and a sharp [65].

Key practice points:

- HCWs who perform EPPs must know their human immunodeficiency virus (HIV), HBV and Hepatitis C virus (HCV) status and undertake annual testing in line with current NSW Health Policy and National Hepatitis B and C testing policies.
- HCWs who are either HCV PCR positive or HBV DNA positive or HBeAg positive or HIV positive must not perform EPPs. Criteria for HCW with HIV, HBV or HCV are under review and are expected to be updated in the near future. These HCWs should seek expert advice. HCWs who do not perform EPPs are not required to undergo routine bloodborne virus testing.

[NSW Health PD2017 010](#)

HIV, Hepatitis B and Hepatitis C
- Management of Health Care
Workers Potentially Exposed

[NSW Health PD2005 162](#)

HIV, Hepatitis B and Hepatitis C
- Health Care Workers Infected

[National Hepatitis B Testing
Policy v1.2](#)

[2017 National Hepatitis C
Testing Policy v1.2](#)

2.5.4 HCW screening and vaccination

Routine HCW screening is not required for most infectious diseases. TB screening should be undertaken for new HCWs who have been born or have lived (≥ 3 months cumulatively) in countries with a high incidence of TB, or new and current HCWs that have recently travelled (≥ 3 months in past three years) to countries with a high incidence of TB. HCWs with direct patient contact (Category) require immunological protection against the

following vaccine preventable diseases: diphtheria, tetanus, pertussis, HBV, measles, mumps, rubella, chickenpox. Annual influenza vaccination is also recommended.

[NSW Health PD2011 005](#)

Occupational Assessment,
Screening and Vaccination
Against Specified Infectious
Diseases

[The Australian Immunisation
Handbook](#) 10th Edition (update
June 2015)

2.5.5 HCWs with cystic fibrosis

HCWs with cystic fibrosis (CF) should consult with their line management around specific requirements for delivery of care. The patient management requirements described in [Section 9.2 - Cystic Fibrosis](#) are not intended to be used to manage HCWs with CF.

HCWs with CF should always adhere to the requirements of standard precautions (including hand hygiene) and where necessary, transmission based precautions.

2.5.6 HCWs with herpes simplex virus

There is a risk that a HCW with an oral/facial lesions (i.e. cold sores) associated with herpes simplex virus (HSV) may transmit infectious material to a patient when providing direct care. The appropriate management response should ensure that these HCWs are not providing direct care to, or in close contact with, high risk patients, such as:

- Neonates
- Newborns
- Patients in delivery suites

- Severely immunocompromised
- Burns patients
- Patients with extensive eczema
- Patients in an operating room if there is an exposed herpetic lesion.

The inclusion of other patient cohorts should be determined locally and be based on risk assessment.

2.6 Healthcare worker education

2.6.1 Mandatory requirements

Completion of mandatory training helps maintain a safe and healthy work environment and must be undertaken by all NSW Health staff to meet:

- A legislative requirement (Tier 1)
- A requirement to be accredited under the NSQHS Standards (Tier 2) and/or
- A requirement under a Policy Directive issued by the Ministry of Health (Tier 3).

This is in accordance with the NSW Health *Mandatory Training Requirements* in Policy Directive (PD2014_023). The term “mandatory training” is reserved for training where the source of obligation results from the abovementioned tiers.

Currently there are 12 core training modules that are mandatory for all clinical staff, including specific infection prevention and control issues; these are hand hygiene, infection prevention and control principles and waste management. In addition, there are a number of additional training requirements targeted to HCWs based on their roles and responsibilities within the organisation.

[HETI Mandatory Education and Training Matrix](#)

[HETI eLearning module: Infection prevention and control principles](#)

[HETI eLearning module: aseptic technique](#)

[HETI eLearning module: hand hygiene](#)

[HETI eLearning module: Invasive devices protocols](#)

[HETI eLearning module: waste management](#)

Further training may be directed locally by a Chief Executive (CE) in response to specific local training requirement and is deemed “CE Directive Training” rather than Mandatory Training.

2.6.2 Local education and training

Each PHO should recognise that additional local education and training may need to be delivered to address contextualised local infection prevention and control issues. Such issues may be identified through gap analysis, as part of the review of local policies, as part of outbreak management or as an outcome of surveillance, auditing or accreditation assessment.

The delivery of local education and training can take many forms. Consideration of the content being delivered and the knowledge levels of the target audience should influence what modes and devices are used.

Informal education should be considered as an essential part of the continuing development of all HCWs. If practical, and without compromising patient dignity or safety, opportunities at the bedside may be useful to provide informal one-on-one or small group infection prevention and control education to HCWs.

2.7 Consumer education

The provision of education to patients and their family and visitors is an effective way to reduce further carriage and spread of infection in the health care setting and in the community. Patient education empowers patients and their family and visitors to feel comfortable to ask questions about their care and participate in infection prevention and control activities. Patient education enables patients to feel free to express their concerns about transmission and infection risks to HCWs. PHOs should continually provide education to their consumers on general infection prevention and control topics, such as hand hygiene and respiratory hygiene and cough etiquette.

[NSQHS Standard 2.3](#)

Facilitating access to relevant orientation and training for consumers and/or carers partnering with the organisation

[Clinical Excellence Commission](#)

Guide to Health Literacy

The time to give infection prevention and control information varies from patient to patient and not every patient will require specific infection prevention and control education. In general, individualised education should be provided to a patient when an infection risk is identified and continued until the risk has subsided. For example, it might be appropriate to provide infection prevention and control education to a surgical patient prior to admission whereas education should be provided to an oncology patient prior to the start of chemotherapy.

Patients should also be provided with education at the time of discharge if ongoing infection prevention and control measures are required. In community health settings, infection prevention and control education should be provided when an infection risk is identified and then continually reviewed as part of the patient's care plan until the risk has abated.

When providing infection prevention and control education to patients, treating clinicians should provide personalised answers to the following questions:

- What is the condition that I have?
- Am I contagious?
- How does my condition affect me, my family and my visitors?
- What can I expect is going to happen to me?
- What can I expect from the HCWs who are looking after me?
- What are my treatment options?
- What are the risks and benefits associated with the different treatment options?
- Are there any alternatives or other options that I should consider?
- What do I need to do?
- When and how do I take my medication?
- How can I protect myself, my family and my friends?
- What do my family and visitors need to do to protect me and themselves?
- What should I do if I am concerned about the transmission and infection risks around me?
- Who can I contact if I have any further questions or need to check something?

[ACSQHC Antimicrobial Stewardship Clinical Care Standard](#)

[ACSQHC information sheets](#)

Carbapenem Resistant
Enterobacteriaceae

[Clinical Excellence Commission information sheets](#)

Clostridium difficile
Carbapenem-resistant
Enterobacteriaceae

[Hand Hygiene Australia information sheets](#)

[NHMRC information sheets](#)

Healthcare associated
infections
Clostridium difficile
Methicillin resistant
Staphylococcus aureus
Vancomycin resistant
enterococci

[NSW Health Infectious Diseases Factsheets](#)

HCW should first provide verbal education to the patient and then, if appropriate, provide the patient with written patient information sheets that have been approved by the PHO. Any written material should be provided to patients as reference material rather than as a primary source of education. Written material should always be explained and discussed with the patient. Every HCW has a responsibility to provide infection prevention and control education to patients in their care and the

patient's family and visitors. HCWs should provide infection prevention and control education to consumers based on the scope and context of the patient/consumer relationship, as illustrated by the following examples:

- A physiotherapist may educate a patient on why their wound must heal before the patient can use the hydrotherapy pool.
- A surgeon may educate a carer on how to help a patient take a shower prior to surgery.
- A diabetes educator may educate the spouse of a diabetic patient on how to purchase a sharps container for the home.
- An infection prevention and control professional may educate a visitor with persistent cough not to visit a relative in NICU.

There may be times when infection prevention and control education may include discussing sensitive patient information (e.g. sexual history, disease status, pregnancy). When providing education to a patient or their family and visitors, clinicians should be aware of the physical environment and seek permission from the patient to disclose any sensitive information to family or visitors.

[NSW Health Privacy Manual for Health Information](#)

Health literacy is the skills, knowledge, motivation and capacity of a person to access, understand, appraise and apply information to make effective decisions about health and health care and take appropriate action [66]. The health literacy of one person may vary markedly to the health literacy of the next person. The health literacy of most patients is usually very different to that of a HCW. Therefore, clinicians should be mindful to use simple and clear language and avoid using medical jargon, such as medical abbreviations, terms and phrases, when providing information and education to consumers. Depending on the individual consumer, it may be necessary to provide education and information in languages other than English. This can be done by engaging the services of a language interpreter.

[NSW Health PD2006_053](#)
Interpreters - Standard Procedures for Working with Health Care Interpreters

PHOs need to ensure that the consumer infection prevention and control information is both accessible and understandable. The development of education and information sheets, pamphlets, videos for mass distribution and consumption should include consideration of the most effective modes and mediums e.g. verbal, written, face to face, paper, phone or online. The language of the information materials should be tested by a broad range of consumer advisors to ensure it is suitable for the target consumer group.

[NSQHS Standard 2.4](#)
Consulting consumers on patient information distributed by the organisation

[NSW Health PD2012_020](#)
NSW Health Policy & Implementation Plan for Culturally Diverse Communities 2012-2016

Clinicians also should seek consumer advice on whether to use signs and symbols, diagrams, images and other visual tools to simplify and reinforce meaning.

[NSW Health GL2005_043](#)
Consumer Representatives - Working with Consumers in NSW Health

Checking whether a consumer understands the infection prevention and control information provided is just as important as providing the information itself. One way to test if a consumer has clearly understood the information provided is to use the 'Teach back' method. An example of 'Teach back' is provided in Case Study 5. A follow up conversation a few days later is also a good way to reinforce education and check that information is clearly remembered and understood.

[NHMRC](#)
How to present the evidence for consumers: preparation of consumer publications

[NHMRC](#)
How to present the evidence for consumers: implementation and dissemination strategies

2.7.1 Evaluating the delivery of information to consumers

As part of a PHO's commitment to quality and consumer focused care, all infection prevention and control consumer information should be evaluated to ensure that the information provided is clear, relevant, easily understood and meets the needs of the healthcare consumer. Examples of methods on how to evaluate information include:

- Review of information by PHO consumer advisory groups
- Consumer surveys or focus groups

Additional information and resources on the development and evaluation of information for healthcare consumers is available from:

- [Clinical Excellence Commission](#) - Partnering with Patients program
- [Health Consumers NSW](#)

2.8 Communication between providers

Processes for communicating a patient's infectious status should be in place whenever responsibility for care is transferred between service providers or PHOs. This includes communicating the status of the patient to the receiving facility and any health-related transport providers such as NSW Ambulance or Non-Emergency Patient Transport.

[NSQHS Standard 3.13.2](#)

Developing and implementing protocols relating to the admission, receipt and transfer of patients with an infection

See [Section 7.7.2](#)

Communicating with other hospitals for information about communicating about patients with MROs

Case study 4: William's story - Using Teach back in the pre-admission clinic

William is having knee replacement surgery next week. He has brought along his wife, Kate, to his pre-admission clinic visit. Simone is the nurse attending to William at the pre-admission clinic. This is a part of their conversation that shows how the Teach back method can be used when having a conversation with a patient.

Nurse Simone: William, your surgery will take place at 11am next Thursday. You will need to be at the hospital at 7am so we have enough time to prepare you for theatre.

William: Okay.

Nurse Simone: Next Wednesday night, you need to take a shower before you go to bed. This is the soap you need to use. It is different to the soap that you buy at the shops. Washing yourself with it will help reduce the risk of you getting an infection from the operation. Are you following me?

Both William and Kate nod their heads in agreement

Nurse Simone: You also need to have a shower on Thursday morning before you come to hospital. So that means two showers with the soap before you come in.

William: Okay.

Nurse Simone: So that I am sure that you know what needs to be done, can you tell me what you are going to do before the surgery next week William?

William: Sure. On Wednesday, I will have a shower at night and then on Thursday morning I will have two showers, using the soap you have given me.

Nurse Simone: Let's go over that again. On Wednesday night you need to take one shower and use this soap. Then on Thursday morning, you need take only one shower and use this soap. How about I give you two bars of soap and I'll write Wednesday night on this bar and Thursday morning on the other bar?

Nurse Simone labels the soap bars

Kate: That will make things easier to remember.

Nurse Simone: Okay William, so tell me in your own words what you are going to do next Wednesday night?

William: I'm going to have a shower after supper and I will use this bar of soap.

William holds up the bar of soap labelled 'Wednesday Night'

Nurse Simone: Great. What else do you need to do?

William: On Thursday morning, I will have another shower and use this bar of soap. Then I'll come in at 7am. I better be clean after all of that!

Nurse Simone: Do either of you have any questions about using the soap?

Kate: Should I use the soap too? We share the same bed and I'll be driving him to the hospital.

Nurse Simone: No need for you to use it Kate. Just use the soap you have at home. After William's two showers, it is unlikely that the bacteria from your body will contaminate William and cause infection.

William turns to Kate

William: You ask too many questions, love.

Nurse Simone: No, it is ok. Please ask me as many questions as you like. It is important that you both know what needs to be done before William's operation.

SECTION 3

RISK IDENTIFICATION OF HEALTHCARE ASSOCIATED INFECTIONS

“Risk assessment is one of the cornerstones of infection prevention and control ...”

The Joint Commission, 2010 [67]



A HAI may occur if a susceptible person acquires a sufficient quantity of a microorganism from either:

- another person;
- the environment; and/or
- from another site on the body.

It is important to initially determine and continually review any risks that promote the transfer and spread of microorganisms and any risks that promote the acquisition of an infection by a susceptible person. Infection risks may be associated with:

- the individual patient;
- the functional area;
- the HCWs providing care; and
- the patient’s family and visitors.

These four factors must be carefully considered to establish whether they increase the risk of HAI.

Where possible, PHOs should use existing risk identification strategies and adopt the principles outlined in this section.

[NSW Health](#)
Health Risk Assessment

3.1 Risk assessing the patient

The patient may be:

- the source of an infection and may promote the transfer of infectious material or
- the target of an infection (i.e. a susceptible host) and have risk factors that promote the acquisition of an infection.

It is important to determine whether a patient is a source of infection as early as possible to prevent the spread of infection to others. The following questions could be used to establish whether the patient is at risk of transmitting infection to others and the environment:

- Is the patient known or suspected of being colonised or infected with an MRO?
- Has the patient recently received or is currently taking antimicrobials?
- Is the patient coughing and/or has fever?
- Is the patient vomiting or has diarrhoea?
- Does the patient have any open wounds?
- Does the patient have any invasive devices?
- Is the patient a resident of a residential care facility?
- Is there a history of recent overseas travel or overseas hospitalisation? (see Table 7)

A patient's susceptibility to an infection is affected by a number of factors. To establish whether a patient is susceptible to infection, clinicians should consider the following risk factors:

- **Age:** In general, immunity is less effective in infants (<2 years) and the elderly (> 65 years). Therefore, these individuals are less likely to mount a strong antibody response to counter an infection.
- **Presence of wounds, ulcers, burns or exfoliative skin conditions:** Skin is a physical defence against infection. Breaches to the skin provide an access portal for infection.
- **Invasive devices:** Invasive devices are an access portal for microorganisms. The longer the dwell time for an invasive device, the greater the risk of infection acquisition.
- **Co-morbidities:** Certain conditions and behaviours, such as immunodeficiency, diabetes and smoking, impair the immune response and increase the propensity for infection.
- **Medications:** Medications, such as chemotherapy and immunosuppressants, preclude normal immune responses.
- **Nutrition and body mass index (BMI):** Malnourished and nutrient deficient individuals, as well as individuals with a high BMI, have an increased susceptibility to infection.
- **Personal hygiene:** Failure to practise hand hygiene may promote contact transmission. Poor perineal hygiene may promote contamination of the urinary tract.
- **Physical contact:** Behaviours that involve physical contact, such as touching, cuddling and mouthing, can increase the likelihood of contact transmission.
- **Contacts:** The more contact there is between the patient and their family, carer and/or HCW, the higher the likelihood of transmission from an infection.
- **Exposure to infectious diseases:** Prior exposure or vaccination may protect the patient from the establishment of infection. In some cases vaccination may also reduce the severity of illness.
- **Travel and medical tourism:** The treating clinician should consider recent travel to an area where communicable diseases or MROs are endemic, including medical tourism.

3.2 Risk assessing the functional area

The transfer and spread of microorganisms to a patient in a specific healthcare environment is largely influenced by the clinical procedures that are taking place and susceptibility of the individual.

When moving patients between different functional areas, clinicians should be mindful that the risk assessment for one setting may not be applicable in another setting and should be reviewed.

Consider adapting the [ACSQHC Aseptic Technique Risk Matrix](#) to determine the functional area risk rating.

3.2.1 Hospital environments

To establish whether a functional area is likely to promote the establishment or spread of a HAI, each functional area in hospitals should be risk assessed with specific consideration to the following matters:

- **Procedures:** Performing a highly invasive procedure that breaches the skin and exposes normally sterile body substances (e.g. blood) and tissue may increase susceptibility to infection.
- **Patient mix:** Consider whether there are certain patients that may be more susceptible to infection than others.
- **Physical environment:** Certain procedures should be carried out in fit-for-purpose settings in order to minimise the risk of transmission (e.g. catheter labs, interventional radiology (IR), operating theatres).

[NSW Health PD2017 013](#)
Infection Prevention and Control Policy

3.2.2 Community settings

In the community setting, care may be provided in a clinical environment like community health or oral health clinics or in a non-clinical environment like a private home, residential aged care facility, group home or community hall.

To establish whether the environment is likely to promote the establishment or spread of infection, the following risk factors need to be considered:

- **Procedures:** Performing an invasive procedure that breaches the skin and exposes normally sterile body substances (e.g. blood) and tissue may increase susceptibility to infection.
- **Cleanliness:** Cluttered, unkempt or unhygienic environments are more likely to increase the risk of infection due to the possibility of breaching aseptic technique. Infections are less likely to be transmitted in environments that are cleaned and/or decontaminated frequently.
- **Equipment and stock:** Single-use equipment including sharps must be used once only and disposed of appropriately. Sterile equipment and stock must not be used when they are not sealed or out of date. Reusing single-use or contaminated sterile equipment and stock increases the risk of infection. Certain clinical procedures require the use of sterile products or equipment. The risk of infection is higher when unsterile products or equipment is used.
- **Reprocessing of reusable clinical and non-clinical equipment:** Failure to clean and/or reprocess reusable equipment after its use will increase the risk of subsequent transmission.
- **Waste management:** Inappropriate clinical waste disposal may promote the spread of infection.
- **Contacts:** The longer the contact between patient or their family and HCW, the higher the likelihood of transmitting microorganisms.
- **Individual:** Consider whether there are certain individuals that may be more susceptible to infection than others.

This assessment should be done initially before the delivery of any care and then reviewed routinely if ongoing care needs to be provided in the setting.

Case study 5: Elizabeth's story - risk assessing in community settings

Elizabeth, a community nurse, receives a referral to provide daily wound care to Dorothy, an 84 year old lady who lives alone with no carers or family. Dorothy has chronic leg ulcers on both lower legs and has been referred by her general practitioner (GP) who took wound swabs when he visited the previous day. The GP was unable to provide Dorothy's medical history as he has just taken over this patient, however, he states Dorothy reported that she had "golden staph" in her leg ulcers a while ago, and the ulcers are getting worse again. She is now finding it very difficult to do the dressings.

On arrival, Elizabeth observes that Dorothy walks with the aid of a walking stick, and her house is extremely cluttered and unkempt. Elizabeth also observes that Dorothy's bandages are dirty and have unravelled. Her legs appear very wet from wound exudate. The house also has a malodorous smell. Dorothy leads Elizabeth into the lounge room where there doesn't appear to be anywhere suitable for Elizabeth to attend the wound care, place her equipment bag, or set up her dressing equipment.

Elizabeth needs to risk assess the situation using the 5 key actions:

1. Establish the context

- Remember this is a home, not a hospital, and environmental cleaning and waste management may not be frequently attended.
- Determine whether there are other residents in Dorothy's home.
- Define on the task: removal of the wound dressings and cleaning and redressing of the ulcer.

2. Identify infection risks

- Continuing to use wet and dirty bandages will promote microbial growth and infection.
- Because of her history of ulcers, Dorothy is susceptible to an infection in her leg.
- Elizabeth is at risk of being exposed to pathogens and other microorganisms that are present in this environment.

3. Assess the risk of infection

- There is a high risk of a severe infection for Dorothy associated with the wet and dirty wound dressings.
- There is a moderate risk of infection for Elizabeth when she is attending to Dorothy because of transmission of microorganisms.
- The most likely way that either Dorothy or Elizabeth will acquire an infection is via contact transmission.

4. Control the risk of infection

- To eliminate the risk of Dorothy acquiring an infection from the current wound dressings, Elizabeth removed and disposed of the old dressings.
- To minimise the risk of the ulcers getting infected during her visit and the transmission risk to herself, Elizabeth moved a stash of newspapers off the coffee table. Elizabeth then performed hand hygiene and set up her aseptic field on a drape on the table. She donned her gown, performed hand hygiene again, put on her gloves and then used aseptic technique to clean and dress the wound. She performed hand hygiene after the procedure.

5. Review effectiveness of control measures

- Elizabeth advised Dorothy to call her if she thought the dressing was dirty or wet.
- The next day Dorothy rang Elizabeth. The dressings were clean and moist but not wet. Elizabeth let Dorothy know that this was okay.
- Elizabeth visited two days later to check on Dorothy. The dressings were moist and there was no evidence of exudate on Dorothy's legs. The dressings were beginning to get dirty so Elizabeth redressed the wound and saw no signs of infection.

3.2.3 Ambulance settings

Paramedic and ambulance care is provided in a variety of settings, and with varying degrees of urgency. The environment within an ambulance vehicle is relatively more controlled than that outside the vehicle. It may be difficult to control the infection risks present outside the ambulance vehicle, however identification of the infection risk factors should form part of scene safety and patient assessment processes.

To establish whether the environment is likely to promote the establishment or spread of infection, the following risk factors need to be considered:

- **Procedures:** Performing a highly invasive procedure that breaches the skin and exposes normally sterile body substances (e.g. blood) and tissue may increase susceptibility to infection.
- **Cleanliness and hygiene of the environment:** Poor environmental cleanliness and hygiene may impact on the application of aseptic technique in this setting.
- **Equipment and stock:** Certain equipment and stock must be used only if sterile. Maintenance of stock sterility in a crowded, mobile and temperature labile environment is difficult and this issue may increase the risk of infection.
- **Reprocessing of reusable clinical and non-clinical equipment:** Failure to clean and/or reprocess reusable equipment after its use will increase the risk of subsequent transmission.

3.2.4 Patient transport settings

Communal patient transport vehicles (i.e. transports more than one patient at a time) should also be considered as a community setting for the purposes of this Handbook. Communal patient transport vehicles are akin to outpatient clinic waiting rooms, as a varied mix of patients may be present at any given time. Infection risks in these settings should be identified in line with [Section 3.2.2](#), *Community settings*.

All other patient transport vehicles should be considered as similar to an ambulance setting and risk assessed in the same way as an ambulance setting is risk assessed ([See Section 3.2.3](#), Ambulance settings).

3.3 Risk assessing visitors

Visitors can also play a role in introducing infection to a patient. A visitor may be a source of infection, particularly given the following factors:

- **Age:** Young children are often reservoirs of infectious material and should have limited access to functional areas where there are highly susceptible patients (i.e. those unable to mount an immune response).
- **Symptomatic illness:** For most infectious diseases, the shedding of infectious material is often associated with symptomatic illness. Be mindful of coughing, sneezing, vomiting, diarrhoea, open wounds or visible exudate.
- **Physical contact:** Frequent and prolonged physical contact is likely to mediate the transfer of microorganisms from the visitor to the patient.

A visitor also may be at risk of infection from the patient and the healthcare environment. Consider these factors to determine if the visitor is at risk of infection:

- **Age:** Infants and the elderly are more susceptible to infection.

- **Presence of open wounds, ulcers, burns or exfoliative skin conditions:** Susceptible skin can be easily infected from direct contact with the patient or by cross contamination from the health care environment.
- **Physical contact:** Frequent and prolonged physical contact is likely to mediate the transfer of microorganisms from the patient to the visitor.
- **Exposure to infectious diseases:** Prior exposure or vaccination may protect the visitor from the establishment of infection. In some cases vaccination may also reduce the severity of illness.

Risk minimisation strategies regarding visitors should include:

- Hand hygiene practices (see [Section 4.1](#), *Hand hygiene*)
- Respiratory hygiene (see [Section 4.8](#), *Respiratory hygiene and cough etiquette*)
- Transmission-based precautions (see [Section 5](#), *Risk mitigation: transmission-based precautions*)
- Delay of the visitation (e.g. 48 hour delay of visit after cessation of gastroenteritis symptoms).

SECTION 4

RISK MITIGATION: STANDARD PRECAUTIONS

“... Standard precautions is the first line of defence in infection control and assumes that all blood and body fluids are potential infectious.”

Sonya Osborne, 2002 [68]



Standard precautions are the minimum precautions required when providing care to a patient at any time and in any care setting.

[Health Practitioner Regulation \(NSW\) Regulation 2010](#)

In NSW, standard precautions comprise the following measures:

- **Correct hand hygiene practices;**
- **Appropriate and correct use of personal protective equipment (PPE);**
- **Use of aseptic technique;**
- **Safe use and disposal of sharps;**
- **Safe injection practices;**
- **Environmental cleaning;**
- **Reprocessing of equipment;**
- **Respiratory hygiene and cough etiquette;**
- **Safe handling and disposal of stock, linen and waste; and**
- **Safe handling and transport of patient specimens.**

Each of these measures will be described in this section in further detail.

Case study 6: Norman's story - when standard precautions aren't used

A 70 year old gentleman, Norman, presented to the hospital's emergency department with chest pain. An IV cannula was inserted in his right forearm for pain relief and intravenous fluids. Norman has experienced a lot of discomfort since arriving at the emergency department and he has been sweating. He is transferred to a ward bed on the same day. The ward appears to be very busy as HCWs are moving from patient to patient without performing hand hygiene. The nurse caring for Norman introduces herself and checks his IV, she finds that the dressing has lifted and there is old blood around the cannula. The nurse has a new IV dressing in her pocket. She removes the old dressing and sticks the new dressing in place. The nurse did not perform hand hygiene before or after the procedure nor did she put on gloves.

It is now day four of Norman's admission, he has a temperature of 38.7°C and the cannula site on his right forearm is inflamed and swollen. The nurse removes the cannula. Blood cultures are collected and intravenous antibiotics are commenced. Twenty four hours later the microbiology results are available and indicate that *Staphylococcus aureus* had grown in the blood cultures.

What happened?

Norman developed a preventable hospital-associated inpatient infection which resulted in increasing his length of stay in hospital by ten days.

The nurse caring for Norman had not performed hand hygiene before and after touching him or before and after performing a procedure. This omission potentially resulted in transmission of microorganisms, including *S. aureus*, from the nurse's hands. Carrying a sterile dressing in the nurse's pocket compromised the integrity of the packaging which could have contaminated the dressing. The nurse did not use aseptic technique when changing the IV dressing and therefore contaminated the IV cannula site.

How could it have been prevented?

If the nurse had performed hand hygiene in accordance with the five moments, transmission may have been avoided. Had the nurse applied the principles of aseptic technique and cleaned the IV site before the application of a clean and intact dressing to the IV site, the risk of infection would have been minimised.

4.1 Hand hygiene

Hand hygiene is recognised as the cornerstone of infection prevention. Hand hygiene is the act of cleaning hands with alcohol based hand rub (ABHR) in either liquid, foam or gel form; antiseptic liquid handwash and running water; or (plain) liquid soap and running water.

[NSQHS Standard 3.5](#)

Developing, implementing and auditing a hand hygiene program consistent with the current National Hand Hygiene Initiative

4.1.1 Hand hygiene principles

HCWs are required to perform hand hygiene:

- Before and after patient contact;
- Before and after a procedure;
- After a body fluid exposure;
- Immediately before and after glove use;
- Between individual patients;
- Between dirty and clean sites on the same patient (in the continuum of care for the patient, the HCW should attend to clean sites before dirty sites); and
- After touching patient surroundings.

For surveillance and auditing purposes these are referred to as the '**5 Moments for Hand Hygiene**' - see [Section 10.2.2, Auditing for the National Hand Hygiene Initiative](#)

[Hand Hygiene Australia](#)

5 Moments for Hand Hygiene

In addition, it is recommended that HCWs perform hand hygiene:

- Upon entering and leaving a ward (for example, at start of shift or going on a break);
- Before eating;
- Before handling patient food;
- After coughing or sneezing or blowing nose;
- After going to the toilet;
- After contact with animals (e.g. companion therapy).

Effective hand hygiene relies on three mechanisms of action [69, 70]:

- The rubbing action, or friction, that enables the mechanical removal of microorganisms;
- The antimicrobial properties of the hand cleansing product (e.g. ABHR, soap) killing remaining microorganisms; and
- The drying of hands after hand cleaning to reduce further spread of microorganisms.

The entire surface of the hands should be covered with hand hygiene product when performing hand hygiene [71]. When performing hand hygiene either:

- Use ABHR on dry, non-soiled hands and rub hands vigorously until the ABHR has evaporated; or
- Use a liquid antiseptic handwash or plain liquid soap with running water, and dry with single use towels (paper or cloth); or
- Perform a water-based surgical hand scrub and dry using a sterile towel; or
- Perform a waterless surgical hand scrub and rub until dry in accordance with the manufacturer's instructions.

Hands must be dried before any procedure, putting on gloves or any patient contact as residual moisture left on the hands may harbour bacteria [72].

The installation and use of high speed hot air dryers is not appropriate for clinical areas of PHO's as there are risks that these dryers will spread pathogens in the clinical setting and therefore increase the risk of cross transmission of organisms [73]. Hot air hand dryers may be considered in non-clinical areas, such as public toilets.

[Australasian Health Facility Guidelines](#)
Part D Infection Control

Hands should be washed with soap and water:

- When hands are visibly soiled, which includes blood or other body fluids;
- After contact with known or suspected bacterial spores such as *C. difficile*; and
- After contact with known or suspected non-enveloped viruses such as norovirus, rotavirus or hepatitis A.

When hands are visibly soiled:

- Use liquid soap and running water which helps to dissolve and lift soiling (fats and proteins) from the skin [74-77]; and
- If soap and water are not available, ABHR should be used.

HCWs should be aware that although ABHR is the preferred product for use in most clinical situations, it is less effective than soap and water against removing and killing bacterial spores and non-enveloped viruses.

4.1.2 Hand hygiene product selection

All selected products should be registered with the TGA and have an Australian Register of Therapeutic Goods (ARTG) number.

When purchasing hand hygiene products, the following selection strategy is recommended:

- The PHO's product selection committee (or delegate committee) should determine the preferred product from the NSW Health contract; and
The PHO's product selection committee (or delegate committee) should include representation/advice from infection prevention and control when making purchasing decisions for hand hygiene products.

See [Section 2.4.1](#), *Purchasing new equipment* for further advice on the purchase of new equipment

ABHR is the preferred option for hand hygiene in the healthcare setting [78]. ABHR is more effective in reducing microbial load compared to antiseptic hand wash or soap and water when hands are not visibly soiled [79, 80]. ABHR is better tolerated by hands, is quicker to use and can be placed at point-of-care locations which makes it more accessible than other hand hygiene products. Hand hygiene products available on NSW Health state contract are to be used.

[Hand Hygiene Australia](#)
Product selection

Each PHO should consider the following factors when purchasing hand hygiene products:

- Chemical composition >70% (volume by volume) alcohol is recommended [81];
- Aesthetic preferences such as fragrance, colour, texture and ease of use;
- Practical considerations such as availability, convenience and functioning of dispenser and ability to prevent contamination;
- Compatibility with other hand hygiene products;
- Dermal tolerance; and
- Value for money.

The clinical activity to be performed should dictate the product and technique used. Table 3 provides advice on the hand hygiene product to use for common clinical activities.

Alcohol free hand rub is not as effective as ABHR [82, 83] and use of alcohol free hand rub should be limited to non clinical areas and places where alcohol based products are prohibited, such as Justice Health and Forensic Mental Health settings (see [Section 4.1.8](#), *Hand hygiene in community settings*) and for HCWs who have been formally assessed with dermal intolerance to ABHR (See [Section 2.5](#), *Staff health and HAI risk*).

[WHO](#)
Guidelines on Hand Hygiene in Health Care

4.1.3 Improving hand hygiene effectiveness

The effectiveness of hand hygiene is improved when: skin is intact, nails are natural, short and unvarnished; hands and forearms are free of jewellery; and sleeves are above the elbow (aka 'bare below the elbows'). In order to reduce the likelihood of transmission of HAIs, HCWs in the clinical environment should ensure that all hand and wrist jewellery is removed and long sleeves are rolled up above the elbow or removed [84]. Personal protective equipment (impervious apron/gowns, gloves, etc.) worn in accordance with the manufacturer's instructions, and in accordance with the infection control or work health and safety policies, is the only forearm attire permitted within the clinical area.

4.1.4 Jewellery

Several studies have shown that skin underneath rings is more heavily colonised than comparable areas of skin on fingers without rings. Wearing of rings in clinical areas must be limited to a plain band on the finger and this should be moved about on the finger during hand hygiene.

Other hand, wrist or forearm jewellery must not be worn by healthcare professionals providing direct patient care unless required for patient care (e.g. watch) or medically essential (e.g. medical alert bracelet). These must be removable and able to be cleaned.

To allow for adequate antiseptic scrubbing of hands and forearms prior to a high risk aseptic or surgical procedure all hand, wrist and forearm jewellery must be removed

Requests from HCWs to wear long sleeved garments or forearm jewellery for religious or medical reasons (e.g. compression bandages, medical alert bracelets) should be assessed by the PHO on a case by case basis, with consideration given to whether the jewellery or garment limits the ability to perform and the effectiveness of hand hygiene.

Table 3. Hand hygiene procedures

*Manufacturer's recommendations should be followed for the amount of solution and duration

Activity		Skin cleansing product*	Action	Duration of handwash or handrub*
Routine situations		Plain liquid soap and running water	Wet hands using running water, apply recommended dose of liquid directly onto hands and work up lather on all areas of the fingers, hands and wrists. Rinse. Dry hands with single use towel.	15-20 seconds
Standard patient care activities	e.g. taking pulse/BP, assembly of needle and syringe, prior to collecting and opening sterile consumables or preparing an aseptic field, and after touching patient surroundings	ABHR	Dispense manufacturer's recommended amount of solution into cupped dry hands. Rub vigorously over all areas of the fingers, hands and wrists until the solution has evaporated and hands are dry.	Until dry (usually 15-20 seconds)
		Plain liquid soap and running water	Wet hands using running water, apply recommended dose of liquid directly onto hands and work up lather on all areas of the fingers, hands and wrists. Rinse. Dry hands with single use towel.	15-20 seconds
		Antiseptic handwash and running water	Wet hands using running water, apply recommended dose of liquid directly onto hands and work up lather on all areas of the fingers, hands and wrists. Rinse. Dry hands with single use towel.	15-20 seconds
	e.g. following care of patients (including contact with their surroundings) where <i>C. difficile</i> or non-enveloped viruses are suspected AND gloves were not worn	Plain liquid soap and running water	Wet hands using running water, apply recommended dose of liquid directly onto hands and work up lather on all areas of the fingers, hands and wrists. Rinse. Dry hands with single use towel.	15-20 seconds
Aseptic procedures	e.g. wound dressing, insertion of IDC, insertion of a PIVC	ABHR	Dispense manufacturer's recommended amount of solution into cupped dry hands. Rub vigorously over all areas of the fingers, hands and wrists until the solution has evaporated and hands are dry.	30-60 seconds
		Antiseptic handwash and running water	Wet hands using running water, apply recommended dose of liquid directly onto hands and work up lather on all areas of the fingers, hands and wrists. Rinse. Dry hands with single use towel.	30-60 seconds
	e.g. insertion of CVAD	ABHR [85]	Beginning with clean and dry hands, apply 3 doses of ABHR in the palm of left hand, using the elbow of the other arm to operate dispenser. Dip fingertips of right hand in the handrub to decontaminate under the nails. Rub solution over all areas of the fingers, hands and wrists until the solution has evaporated. Repeat, beginning with dispensing ABHR in palm of right hand and continue to rub all surfaces until hands are dry.	Minimum 60 seconds
		Antiseptic handwash and running water	Wet hands using running water, apply recommended dose of liquid directly onto hands and work up lather on all areas of the fingers, hands and wrists, paying attention to the finger nails.	2 minutes
Surgical procedures	i) Surgical pre wash (Conducted before the first surgical hand scrub or surgical ABHR of the list, to ensure the hands are free of soil and debris, and fingernails are clean)	Plain liquid soap and running water	Wet hands using running water, apply recommended dose of liquid directly onto hands and work up lather on all areas of the fingers, hands and wrists, paying attention to finger nails. Rinse. Dry hands with single use towel.	1 minute
	ii) Surgical hand scrub	Antiseptic handwash and running water	Wet hands using running water, apply recommended dose of liquid directly onto hands and work up lather on all areas of the fingers, hands, wrists and forearms for 2 minutes then rinse and repeat for a further 2 minutes for first scrub and 1 minute for subsequent scrubs of the list. Rinse. Dry hands with a sterile towel.	5 minutes for first operative procedure of the day 3 minutes for subsequent operative procedures
	iii) Surgical hand rub	ABHR	Use ABHR for surgical hand scrub strictly in accordance with the product manufacturer's instructions for amount, technique and duration	In accordance with specific manufacturer's instructions

4.1.5 Hand care and skin integrity

Selected ABHRs, antiseptic hand washes, surgical hand scrubs and moisturising lotions should be chemically compatible and pH neutral (pH 5.5 to 7) to minimise skin reactions and to ensure that the decontaminating properties of the hand hygiene product are not deactivated [81]. Good skin integrity is aided by good hand hygiene technique. ABHR should be dispensed onto dry hands while liquid soaps and antiseptics should be applied to hands already wet with water (see Table 3).

Hand care problems such as dryness, dermatitis and/or sensitivity should be reported to the manager/supervisor for action or referral to address hand care problems (see [Section 2.5, Staff health and HAI risk](#)). HCWs who have cuts and abrasions on exposed skin and are involved in direct patient care, sterilisation services or food services should consult with their supervisor or manager and/or staff health for further advice and assessment (see [Section 2.5.2, Managing HCWs](#)). HCWs should check their hands and forearms regularly to ensure they have good skin integrity. ABHR is a good marker of skin integrity as a sting from ABHR application indicates broken skin. All broken skin should be covered with an impervious dressing. Given the potential for the contamination and infection transmission, it may be inappropriate for a HCW to work clinically if they require multiple impervious dressings, hand splints or are unable to wear impervious dressings for certain medical conditions. In this instance a risk assessment of the HCW should be undertaken to determine whether the HCW can undertake clinical duties without compromising patient safety and their own safety (see [Section 2.5.1, Risk assessing HCWs](#)).

4.1.6 Fingernails

Nail varnish is not to be worn by healthcare professionals providing direct patient care. Chipped nail varnish supports the growth of larger numbers of organisms on the fingernails. Nail art and technology are not to be worn. There is limited information about nail art and technology but they may be a potential reservoir of microorganisms.

Artificial nails are not to be worn by healthcare professionals providing direct patient care as the literature suggests that artificial nails may promote transmission and infection [86-89]. Recent evidence supports that short fingernails minimises the risk of transmission [90]. Shorter nail length does not impede effective hand hygiene and is less likely to puncture gloves. An easy guide to appropriate fingernail length is to keep the nail shorter than the end of the finger.

4.1.7 Hand hygiene in oral health settings

In non-theatre based oral health settings, adequate hand hygiene should be performed during the delivery of patient care as described in [Section 4.1.1, Hand hygiene principles](#). In these settings, adequate hand hygiene means washing/cleaning and drying up to and including the wrists. If providing oral health care within an operating theatre (e.g. complex oral surgery), HCWs should comply with the usual hand hygiene principles expected for surgical environments (see Table 3).

4.1.8 Hand hygiene in community and home settings

HCWs are to practise hand hygiene when providing care in community and home settings and should only use hand hygiene products supplied by the PHO. HCWs should not use hand hygiene products, cloths and towels (paper or otherwise) supplied by patients as there is potential for these items to be contaminated.

4.1.9 Hand hygiene in Justice Health and Forensic Mental Health settings

NSW legislation prohibits the supply and use of alcohol-containing products in Corrective Services NSW facilities. According to legislation:

- ABHR products must not be used in any PHO that operates within these facilities; and
- PHOs operating within Corrective Services NSW facilities must provide an alternative hand hygiene product that is alcohol-free, non-intoxicating and non-flammable for the use of HCWs, patients and visitors in this setting.

[Crimes \(Administration of Sentences\) Regulation 2014 - Reg 148](#)

[Summary Offences Act 1988 – Sect 27B Trafficking](#)

[NSW Justice Corrective Services Visiting a Correctional Centre](#)

4.1.10 Patient and visitor hand hygiene

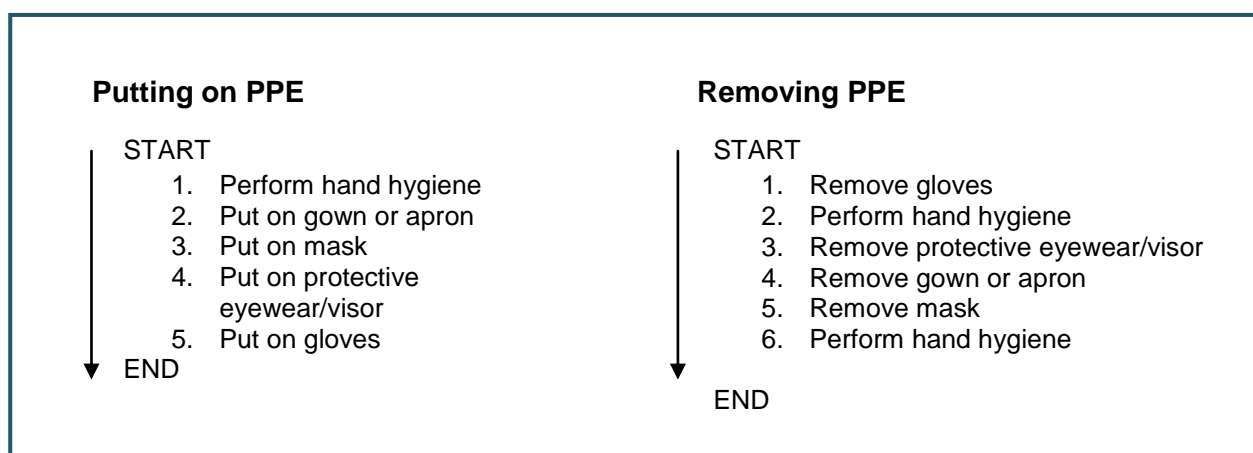
Patients and visitors are to be encouraged to perform hand hygiene on entry to a healthcare facility, a ward or a community health outpatient setting and prior to visiting patients. In line with [Section 2.7, Consumer education](#), educational resources should be made available to encourage the practice and technique of hand hygiene. This should include the placement of signs and posters in key locations, such as entry and exit points, to act as visual triggers for patients and visitors. Patients and visitors should be encouraged to use the same hand hygiene products as HCWs. The PHO should ensure that these products are readily accessible in common waiting areas and appropriate patient areas. The PHO should ensure that HCWs have the means and resources to enable patients to perform hand hygiene if mobility is a concern (i.e. providing ABHR for a bed-bound patient).

HCWs should also encourage patients to have hand hygiene discussions with their treating team.

4.2 Personal Protective Equipment

Appropriate PPE should be selected to prevent contamination of skin and/or clothing. Selections should be guided by the anticipated type and amount of exposure to blood and body substances and the likely transmission route of microorganisms. The following sequences are recommended practice for putting on and removing PPE for all clinical settings outside the operating room (see Figure 2).

Figure 2. Sequence for putting on and removal of PPE [91]



In certain circumstances, where there may be a heightened risk for HCWs and patients (e.g. during the 2014 Ebola Virus alert), additional PPE requirements may apply[92]. Hand hygiene is to be performed if hands become contaminated at any step, and always after removing gloves. HCWs working inside operating rooms should refer to local procedures that detail the correct putting on and removal sequences for this particular setting.

At any time, if a HCW's clothing becomes contaminated with blood or body substances, the clothing should be removed as soon as possible and before the HCW attends to other patients. According to the NSW Health *Infection Prevention and Control Policy* ([PD2017_013](#)):

- If skin is contaminated with blood or body substances, the HCW must remove contaminated clothing/uniform or PPE and then perform hand hygiene and wash any other affected skin;
- If broken skin has been contaminated by blood or body substances, the occupational exposure must be reported to the PHO using local procedures; and
- Each PHO must procure and provide appropriately designed and sized PPE for HCWs working in the PHO.

[NSQHS Standard 3.7](#)

Promoting collaboration with occupation health and safety programs to decrease the risk of infection or injury to HCWs

[NSW Health PD2017_010](#)

HIV, Hepatitis B and Hepatitis C - Management of Healthcare Workers Potentially Exposed

[NSW Health PD2017_013](#)

Infection Prevention and Control Policy

4.2.1 Gloves

Gloves are worn as a barrier to protect the wearer's hands from contamination or to prevent the transfer of organisms already on the hands. In line with the NSW Health *Infection Prevention and Control Policy* ([PD2017_013](#)), intact gloves must be worn on both hands and must be used in situations where the HCW is potentially exposed to blood or body substances; in particular:

- During any procedure where direct contact is anticipated with a patient's blood or body substance, mucous membrane or non-intact skin;
- While handling items or surfaces that have come into contact with blood or body substances; and
- While performing an invasive procedure, venepuncture or a finger or heel prick.

AS/NZS 4179:2014

Single-use sterile surgical rubber gloves - Specification (ISO 10282:2014, MOD)

AS/NZS 4011: 1997

Single-use examination gloves – Specification

AS/NZS 4011.1:2014

Single-use medical examination gloves - Part 1: Specification for gloves made from rubber latex or rubber solution (ISO 11193-1:2008, MOD)

AS/NZS 4011.2:2014

Single-use medical examination gloves – Part 2: Specification for gloves made from poly(vinyl chloride) (ISO 11193-2:2006, MOD)

Unless exposure to blood is anticipated, HCWs do not need to wear gloves when performing subcutaneous, intramuscular or intradermal injections.

Gloves must be removed and discarded:

- As soon as a tear or puncture appears or when the integrity has been otherwise compromised;
- After patient contact has been completed and before providing care to another patient;
- When performing separate procedures on the same patient;
- After completing a task not involving patients but requiring gloves;
- Before touching environmental items and surfaces;
- Before or on leaving a patient's room/zone. This may be risk assessed if required to remove contaminated or soiled equipment from the patient zone; and
- Before writing in the medical notes, answering the telephone, using the computer and moving or touching equipment.

[NSW Health PD2017_013](#)

Infection Prevention and Control Policy

[NSW Health PD2012_061](#)

Environmental Cleaning Policy

[Environmental Cleaning SOP](#)

Module 3.2 Furnishings and Fixtures

Wearing gloves does not eliminate the need for hand hygiene and in all circumstances, hand hygiene is to be performed immediately:

- Before putting on gloves to avoid contamination of the outer surface of the gloves; and

- After removing gloves to avoid transfer of microorganisms to other persons or environment and to protect the HCWs.

The type of glove selected should be appropriate to the type and risk of the procedure (see Table 4) and of a suitable size for the user. In addition, the PHO should consider the supply of non-latex gloves for HCWs and patients who are latex sensitive. Use of general purpose gloves, such as reusable washing up gloves, should be limited to kitchen areas. Within sterilisation services/areas, only disposable single use gloves that have been approved should be worn. Medical examination gloves or other disposable, single use gloves are not to be reused. If gloves become soiled, HCWs are to remove and discard the gloves, and perform hand hygiene.

Table 4. Glove selection guide

Glove type	Use
Seamed plastic or vinyl gloves	Are only to be used in food preparation areas
Medical examination gloves (including nitrile gloves)	Are to be used for all procedures (except sterile procedures) that involve direct or potential contact with non-intact skin, mucosal membranes, blood or body substances or environmental cleaning
Sterile gloves	Are to be worn when it is necessary to touch key sites and parts directly[1]

4.2.2 Facial protection

Facial protection is used to protect the mucous membranes of the face (eyes, nose and mouth) from exposure to blood and body substance splash or spray. The level of protection required should be determined by the volume and distribution of blood or body substances likely to be encountered during patient care.

For standard precautions, the types of facial protection include:

- Face shield/visor;
- Protective eyewear; and
- Fluid-resistant surgical mask

Face shield/visor or protective eyewear is to be worn:

- For all invasive procedures including, but not limited to, surgery, insertion of central lines, peripheral venous lines, endoscopies and haemodialysis line management;
- For the disposal of liquid blood and body substances;
- When changing and emptying urinary catheter drainage devices; and
- During procedures that induce the patient to cough e.g. chest physiotherapy.
- When performing aerosolising generating procedures (section 5.1; 9.6.1)

Face shields/visors are to be optically clear and able to be safely removed without self-contamination. Disposable single use shields must be discarded immediately after use. Reusable shields are to be cleaned after each use and stored dry.

According to the NSW Health *Infection Prevention and Control Policy* (PD2017_013), protective eyewear is to conform to Australian Standards

NSW Health PD2017_013
Infection Prevention and Control
Policy

and be optically clear, anti-fog, distortion free, close fitting and shielded at the sides. Protective eyewear is to be worn, fitted and cleaned in accordance with the manufacturer's instructions and should be stored clean and dry after use. Any protective eyewear that is labelled 'single use' must not be reused. General prescription glasses alone do not comply with the relevant national standards and protective eyewear must be worn with prescription glasses if there is a risk of being splashed with blood or body substances.

AS/NZS 1336:2014
Eye and face protection -
Guidelines
AS/NZS 1337.1:2010
Personal eye protection - Part 1:
Eye and face protectors for
occupational applications

A fluid resistant surgical mask is to be worn:

- In surgery or for invasive or dental procedures to prevent blood and body substance exposure; and
- In the operating room to protect the patient against respiratory microorganisms which may be expelled by the HCW.

AS4381:2015
Single use face masks for use
in healthcare

A fluid resistant surgical mask will:

- Be worn and fitted in accordance with the manufacturer's instructions;
- Not be touched by hands or gloves while worn;
- Cover both the mouth and nose while worn;
- Not be worn loosely or folded down around the neck; and
- Be removed and discarded immediately after leaving the patient-zone/room.

When the mask becomes moist from the wearer or from contamination, the barrier has been breached and the mask is no longer effective. It should then be discarded and not used again. The mask is to be removed by touching the strings/ties or loops only.

Use of surgical masks by patients and visitors is covered under [Section 4.8](#), *Respiratory hygiene and cough etiquette*, and [Section 5.4](#), *Personal Protective Equipment (PPE) requirements*.

4.2.3 Gowns and aprons

A single use fluid-resistant gown, or apron made of impervious material, provides a barrier to reduce opportunities for contact transmission in healthcare settings. The NSW Health *Infection Prevention and Control Policy* ([PD2017_013](#)) states that an apron or gown must be worn:

- During any procedures where there is a risk of splashes or contamination with blood or other body substances;
- As a protective layer under a permeable sterile gown when performing invasive procedures, especially if the procedure involves the likelihood of splashes or contamination with blood or other body substances; and
- Alternatively, a disposable sterile, impermeable gown can be worn when performing invasive procedures.

Cloth (patient) gowns do not provide any level of protection for HCWs undertaking procedures and they are not to be worn in clinical areas, including oral health, maternity units and medical imaging, and during patient care. In the operating room HCWs should wear an impervious sterile gown or a plastic impervious apron underneath the sterile cloth gown to provide protection from strike through.

Aprons and gowns are to be removed in a manner that prevents contamination of clothing, skin or the environment (see [Section 4.2](#), *Personal protective equipment*).

Case study 7: Naomi's story - a lesson in contact precautions

Naomi is a 25 year old woman who presented to the local hospital's maternity unit with labour pain. Information regarding her medical history, antenatal care, previous pregnancies and birth was gathered and the midwife reviewed Naomi's file.

During a recent antenatal assessment Naomi disclosed that she had some boils under her arm that were quite painful. The midwife noted that an axillae swab taken during this previous visit returned positive for methicillin-resistant *S. aureus* (MRSA). The midwife explained that MRSA can be acquired by contact with someone with MRSA or MRSA-contaminated items and surfaces. The midwife also explained to Naomi that to reduce the risk of transferring MRSA to other patients, she will be nursed in isolation and that any healthcare workers in direct contact with her will be wearing gowns, and gloves if they need to do procedures only. The importance of personal hand hygiene for patients, visitors and when caring for her baby is explained to Naomi and the midwife gives her an information factsheet about MRSA. She then continues her assessment adhering to contact precautions. The midwife also arranges for a medical consult to review Naomi's MRSA treatment options.

Naomi's labour progressed and a baby boy was delivered via vaginal birth later that day.

What happened?

Upon transfer to the post-natal ward, Naomi was placed in a single room with a contact precautions sign on the door. Her son was not placed in the nursery but shared the room with her. Naomi followed the advice of her healthcare team and used ABHR before and after contact with her baby and regularly throughout her stay. She was also compliant with remaining in her room for her admission so as not to spread the bacteria further within the hospital. Naomi's medical consult provided some treatment options and a recommendation for GP follow-up after discharge.

What is the lesson to be learnt?

Being nursed in isolation because of a potentially harmful multi-resistant organism, and having healthcare workers maintaining contact precautions for the duration of admission, can be very stressful for patients. Naomi's healthcare team initiated early information-sharing and discussed options for treatment, while working with her to reduce the risk of further transmission to other patients and the healthcare environment.

4.3 Use of aseptic technique

Aseptic technique is a set of practices aimed at minimising contamination and is particularly used to protect the patient from infection during procedures [1, 93]. Many of the other work practices that form standard precautions are required for aseptic technique; However, adherence to these practices alone does not constitute aseptic technique. Sterile single-use equipment or instruments must be used according to manufacturer's instructions and in such a way that the sterility of the item is maintained.

The five essential principles of aseptic technique are:

1. Sequencing:

- Performing a risk assessment
- Pre-procedure preparation
- Performing the procedure
- Post procedure practices, handover and documentation

2. Environmental control:

[NSQHS Standard 3.10](#)

Developing and implementing protocols for aseptic technique

[HETI online](#)

Aseptic technique

[Section 9.5.4](#)

Aseptic technique in interventional radiology

- Prior to aseptic procedures, healthcare workers must ensure there are no avoidable nearby environmental risk factors, such as bed making or patients using commodes

3. Hand hygiene:

- Perform hand hygiene before a procedure and after a procedure or body fluid exposure

4. Maintenance of aseptic fields:

- Cleaning and/or disinfection of key site(s) and key part(s) prior to procedure(s)
- Establishing an aseptic field
- Use of sterile equipment
- Maintenance of the aseptic field, including protecting the key sites and key parts
- Use of a non-touch technique

5. PPE:

- Correct selection and use of sterile and non-sterile PPE

Each PHO is to undertake a local risk assessment to identify medium and high risk procedures that require the use of aseptic technique. The PHO is to regularly audit the use of aseptic technique and evaluate audit data locally to identify opportunities for compliance improvement.

[ACSQHC
Aseptic Technique Risk
Matrix](#)

Each PHO should provide its clinical workforce with, or access to, aseptic technique education. HCWs that perform procedures that require aseptic technique are to be trained in aseptic technique and are responsible for maintaining aseptic technique competencies. The PHO is to maintain a central record describing the aseptic technique education and competencies of its clinical workforce.

4.3.1 Invasive devices

According to the NSW Health *Infection Prevention and Control Policy* ([PD2017_013](#)), each PHO must have written policies and/or procedures to instruct on the management of all types of invasive devices, including intravascular devices.

For specific guidance on invasive devices, HCWs should consult the NSW Health *Adult Urethral Catheterisation for Acute Care Settings* Guideline ([GL2015_016](#)), the NSW Health *Peripheral Intravenous Cannula (PIVC) Insertion and Post Insertion Care in Adult Patients* Guideline ([GL2013_013](#)), the NSW Health *Central Venous Access Device Insertion and Post Insertion Care* Policy Directive ([PD2011_060](#)).

Documentation of procedures requiring aseptic technique should include indications for the procedure(s), any clinical misadventures that occurred during the procedure, and any follow up or review requirements.

4.3.2 Lumbar puncture and intra-articular injection procedures

When performing a lumbar puncture or an intra-articular injection procedure, HCWs should wear a surgical mask when placing a catheter or injecting material into the spinal canal or subdural space (i.e. during myelograms, lumbar puncture and spinal or epidural anaesthesia). HCWs

[NSQHS Standard 3.8](#)

Developing and implementing a system for use and management of invasive devices based on the current national guidelines for preventing and controlling infections in health care

[NSQHS Standard 3.9](#)

Implementing protocols for invasive device procedures regularly performed within the organisation

[NSW Health PD2011_060](#)

Central Venous Access Device Insertion and Post Insertion Care

[NSW Health GL2013_013](#)

Peripheral Intravenous Cannula Insertion and Post Insertion Care in Adult Patients

[NSW Health GL2015_016](#)

Adult Urethral Catheterisation for Acute Care Settings

[ACI \(Intensive Care NSW\)](#)

should wear a surgical mask when injecting into intra-articular joints [94].

Central venous access device -
Post insertion management

[HETI online](#)
Invasive Device Protocols

4.3.3 Skin antisepsis

Where skin antisepsis is required in preparation for an aseptic procedure (e.g. central line insertion, peripheral intravenous cannulation, lumbar puncture, drain insertion, surgical procedure), a single-use antiseptic skin preparation should be used [94, 95]. After use, the skin preparation and any remaining contents should be discarded. To enable this practice, the PHO should purchase antiseptic skin preparations in single-use containers/wipes.

[NSW Health Safety Information 001/13](#)
Safe Use of Alcohol Based Skin Preparations for Surgical and Anaesthetic Procedures

4.3.4 Aseptic technique in oral health

The five essential principles for aseptic technique (see [Section 4.3, Use of aseptic technique](#)) are to be used for chair-side procedures in oral health. The patient's submucosal oral tissues are the key sites - that is, they are the susceptible body sites that should be protected from microorganisms on hands, gloves, surfaces and equipment.

[NSW Health PD2013_026](#)
Oral Health: Post-Operative Care for Dental Extractions

[NSW Health PD2013_024](#)
Oral Health: Cleaning, Disinfecting and Sterilizing

Most of the instruments and equipment used routinely in oral health, such as probes and scalers, are classified as invasive devices, and therefore should be handled aseptically. The key parts of those instruments are, for example, the tip of a probe or the tip of a scaler. The key parts of a local anaesthetic set-up using an aspirating syringe are both ends of the sterile needle and the sterile bung of the anaesthetic cartridge that will be pierced by the needle. These key parts - and others identified for other instruments and devices - should also be protected from microorganisms on hands, gloves, surfaces and equipment.

The aseptic field for a routine dental procedure can be prepared by either using the instrument cassette in which the instruments were sterilised, or placing a clean single-use cloth on the clean bracket table. The cap of the local anaesthetic needle is used as a critical micro-aseptic field to protect the needle from contamination.

4.4 Safe use and disposal of sharps

The potential for exposure to bloodborne viruses is greatest when medical devices, such as needles, scalpels and other sharp instruments, are used [96-102]. Therefore, the use of sharps should be minimised wherever possible and, when used, be disposed of immediately after use at the point of care. In accordance with the NSW Health *Infection Prevention and Control Policy* ([PD2017_013](#)), each PHO must have a written policy and/or procedure in place for the safe handling, transportation and reprocessing and disposal of sharps. A PHO must also provide training to HCWs on sharps handling, disposal and, where appropriate, cleaning and reprocessing.

[NSQHS Standard 3.16](#)
Reprocessing reusable medical equipment, instruments and devices
in accordance with relevant national or international standards and manufacturers' instructions

[NSQHS Standard 3.7](#)
Promoting collaboration with health and safety programs to decrease the risk of infection or injury to healthcare workers

[NSW Health PD2008_004](#)
Community Sharps Disposal by Area Health Services

[NSW Health PD2007_052](#)
Sharps Injuries - Prevention in

Where possible, a PHO should purchase and ensure the use of safety equipment for sharps handling, particularly in areas where there is high sharps use and/or in areas where there has been a number of occupational exposures relating to sharps handling. Each HCW is responsible for the

4.4.1 Blood glucose monitoring devices

The following practices are recommended when using blood glucose monitoring devices:

- When performing glucose monitoring procedures, HCWs should use aseptic technique.
- The glucometer and its protective casing is to be cleaned and disinfected after use and between patients, regardless of visible soiling.
- Restrict use of fingerstick capillary blood sampling devices to individual patients [103].
- Use single-use lancets that permanently retract upon puncture. Never reuse fingerstick devices and lancets.
- Dispose of fingerstick devices and lancets at the point-of-care in an approved sharps container (see [Section 4.4, Safe use and disposal of sharps](#)).

4.4.2 Sharps in community and home settings

In clinical community settings, such as community health centres or multi-purpose services, sharps should be handled consistent with standard precautions.

In non-clinical community settings, such as within a patient's home, used sharps generated during the provision of care must be safely disposed of into a sharps container. In accordance with the *Community Sharps Disposal by Area Health Services Policy Directive (PD2008_004)*, the container must be closed, securely stored and transported within a compartment in the car and separated from the driver's compartment, in line with work health safety requirements. The container should be transported to a hospital, community health centre or multi-purpose service for final disposal.

[NSW Health PD2008_004](#)
Community Sharps Disposal
by Area Health Services

4.5 Safe injection practices

Breaches in safe injection, infusion and medication vial handling practices has resulted in transmission of HIV and viral hepatitis and in some cases caused outbreaks of disease [3, 103, 104]. Standard precautions, particularly aseptic technique, form the basis of safe injection practices. This section focuses on the safe injection practices required to ensure patient and healthcare worker safety.

4.5.1 Applying aseptic technique

The following practices are recommended in the context of aseptic technique and safe injection practices:

- Perform hand hygiene prior to accessing supplies, handling vials and intravenous (IV) solutions, and preparing or administering medications.
- Ensure that reusable equipment used for aseptic technique procedures are cleaned and disinfected between use.
- Use aseptic technique in all aspects of parenteral medication administration, medication vial use and injections.
- Store and prepare medications and supplies in a clean area on a clean surface.
- Never store needles and syringes unwrapped as sterility cannot be assured.

NSW Health Safety Information 002/14
[Propofol – importance of aseptic technique and safe administration practices](#)

Section 4.3
Use of Aseptic Technique

- Discard all opened vials (including multi-dose vials), IV solutions and prepared or opened syringes that were involved in an emergency situation.

4.5.2 Sharp injecting devices

The following practices are recommended in the context of sharp injective devices and safe injection practices:

- Open the sterile needle, cannula, syringe or Epi-pen from package immediately prior to use.
- Needles, cannulae and syringes are sterile, single-use items; do not reuse these for another patient or to access a medication or solution that might be used for a subsequent patient.
- Use safety engineered sharps devices whenever possible.
- Discard syringes, needles and cannulae at the point of care in an approved sharps container.

[NSW Health PD2015_007](#)

Pharmaceuticals –
Preparation in NSW Public
Health Facility Pharmacy
Services

[NSW Health PD2008_004](#)

Community Sharps
Disposal by Area Health
Services

[NSW Health PD2007_052](#)

Sharps Injuries - Prevention
in the NSW Public Health
System

[Section 4.4](#)

Safe use and disposal of
sharps

4.5.3 Intravenous solutions

The following practices are recommended in the context of intravenous solutions and safe injection practices:

- Protective packaging should not be removed until immediately prior to use.
- Never use intravenous solution containers (e.g. bags or bottles) to obtain flush solutions for more than one patient. Never use infusion supplies such as needles, syringes, flush solutions, administration sets or intravenous fluids on more than one patient.
- Additions to intravenous fluids should be made under controlled conditions where possible or else prepare immediately prior to administration using aseptic technique.
- Begin/initiate administration of spiked IV solutions (IV bag entered by the tubing spike) within one hour of preparation. If administration has not begun within one hour of spiking, the IV bag and tubing shall be promptly discarded.
- Check the expiry date on IV solution; do not use if it is expired.
- Disinfect IV ports using friction and 70% (v/v) alcohol, and allow to air dry prior to accessing.
- Except for transient controlled disconnections such as changing IV infusions, removing a sling or sleeve, or access in Operating Theatres, Medical Imaging or Radiology Departments, if the IV giving set is disconnected, replace the entire IV tubing.

[NSQHS Standard 4.10](#)

Ensuring that medicines are
distributed and stored securely,
safely and in accordance with the
manufacturer's directions,
legislation, jurisdictional orders and
operational directives.

[NSW Health PD2013_043](#)

Medication Handling in NSW Public
Health Facilities

[NSW Health GL2013_013](#)

Peripheral Intravenous Cannula
(PIVC) Insertion and Post Insertion
Care in Adult Patients

4.5.4 Flushing

Single dose syringes should be used for flush solutions. Disinfect IV ports using friction and 70% (v/v) alcohol, and allow to air dry before accessing.

4.5.5 Medication vials and ampoules

The following practices are recommended in the context of medication vials and ampoules and safe injection practices:

- Follow the manufacturer's instructions for storage and use.
- Use single-use ampoules or single-dose vials. Always use a sterile syringe and needle/cannula when entering a vial.
- Never enter a vial with a syringe or needle/cannula that has been used on a patient.
- Cleanse the rubber stopper/bung of the vial using friction and 70% (v/v) alcohol and allow to air dry before inserting a device into the vial.
- Discard single dose vials after use. Do not use them again for another patient.
- Unwanted portions of ampoules must be discarded at the time the dose is prepared.
- Never store medication vials in clothing or pockets.
- Inspect vials and discard if sterility has been compromised, or is thought to be compromised.
- Examine the vial for any particulate matter, discoloration or turbidity. If present, do not use and discard immediately. All vials used during an emergency should be discarded as sterility cannot be guaranteed.

[NSQHS Standard 4.10](#)

Ensuring that medicines are distributed and stored securely, safely and in accordance with the manufacturer's directions, legislation, jurisdictional orders and operational directives.

[NSW Health PD2013_043](#)

Medication Handling in NSW Public Health Facilities

[NSW Health GL2013_013](#)

Peripheral Intravenous Cannula (PIVC) Insertion and Post Insertion Care in Adult Patients

4.5.6 Multi-dose vials

A multi-dose vial is a vial of liquid medication intended for parenteral administration (injection or infusion) that contains more than one dose of medication. Multi-dose vials are labelled as such by the manufacturer and typically contain an antimicrobial preservative to help prevent the growth of bacteria. The preservative has no effect on viruses and does not protect against contamination when HCWs fail to follow safe injection practices. An example of multi-dose vials include, insulin vials, botox, tuberculin skin test vials, allergy testing vials. The following practices are required in the context of multi-dose vials and safe injection practices, in accordance with the NSW Health *Infection Prevention and Control Policy* ([PD2017_013](#)) and NSW Health *Medication Handling in NSW Public Health Facilities Policy Directive* ([PD2013_043](#)):

- If a multi-dose vial must be used, it should be used for a single patient whenever possible and discarded immediately after use [3, 103]. Each entry into the multi-dose vial must be with a new unused sterile needle and syringe, even if the vial is dedicated to a single patient.
- Multi-dose vials must only be used between multiple patients where there is no other alternative product available on the Australian market.
- Keep multi-dose vials away from the immediate patient environment [103]. Dispose of opened multi-dose medication vials 28 days after opening, unless specified otherwise by the manufacturer, or sooner if sterility is questioned or compromised.
- Date opened multi-dose vials to reflect date opened and/or date of expiration. An organization may choose to establish a system wide opened multi-dose discard schedule, i.e., one date a month established to discard all opened multi-dose vials no matter when the vial was opened during the month.

[NSQHS Standard 4.10](#)

Ensuring that medicines are distributed and stored securely, safely and in accordance with the manufacturer's directions, legislation, jurisdictional orders and operational directives.

[NSW Health PD2013_043](#)

Medication Handling in NSW Public Health Facilities

[NSW Health PD2017_013](#)

Infection Prevention and Control Policy

There are some medical systems within the Australian healthcare market that are labelled as multi-dosing systems where a drug, fluid, radiation treatment or contrast medium is accessed from one source such as, bag, vial or syringe for multiple patients. These should only be considered if no other alternative product is available on the Australian market. These relevant products and devices must be registered with the TGA and PHOs must identify them and develop clear local protocols for their management.

4.6 Environmental cleaning

At the minimum, routine environmental cleaning in each PHO should include:

- Prompt disposal of single use items, such as adhesive tapes and gloves, after use;
- Surfaces frequently touched by patients, such as bed rails, chair rails, tables and door handles, are routinely cleaned;
- Devices frequently touched by patients and HCWs, including sphygmomanometer, glucometer, IV pumps and monitors;
- All blood and body substance spills are cleaned and disinfected; and
- Minimise clutter in shared administrative areas, such as clinical nurses workstations, and ensure that keyboards, computers, tablets, telephones (including personal mobiles) and other frequently touched surfaces are routinely cleaned.

[NSW Health PD2012_061](#)
Environmental Cleaning Policy

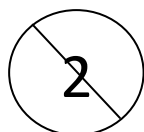
4.7 Patient equipment - Reprocessing

Advice on reprocessing is provided in Section 8, *Reprocessing*.

[NSQHS Standard 3.16](#)
Reprocessing reusable medical equipment, instruments and devices in accordance with relevant national or international standards and manufacturer's instructions

4.7.1 Single use or single patient use equipment

Single use equipment is either indicated on its packaging by the text 'Single use' or by the international symbol for single use:



Single patient use equipment is indicated on its packaging by text stating 'Single patient use'.

[Australian Regulatory Guidelines for Medical Devices Version 1.1](#)
Part 2, Chapter 19 Single use devices (SUDs) and the reuse of SUDs

Equipment which is labelled by the manufacturer for single patient use, including insulin pens and asthma spacers, must not be used for more than one patient or individual user. Cleaning and reprocessing of such devices is to be performed in accordance with the manufacturer's instructions and [Section 8, *Reprocessing*](#). Single patient use equipment should be cleaned and stored as per the manufacturer's instructions between periods of use.

Any sterile single use or single patient use equipment is to be used according to the manufacturer's instructions and in such a way that the sterility of the item is maintained before patient use. If indicated by the manufacturer, unsterile single use or single patient use equipment must be sterilised before patient use.

If single use equipment and single patient use equipment is soiled, it should be immediately discarded.

4.8 Respiratory hygiene and cough etiquette

To minimise the risk of transmission of infection to others, everyone entering, visiting or working within a PHO presenting with the signs and symptoms of respiratory infection should practise respiratory hygiene and cough etiquette [105]. A PHO should encourage and enable patients, visitors and HCWs to perform respiratory hygiene and cough etiquette and provide appropriate resources to support these behaviours [106]. Specific responsibilities for the PHO and individuals visiting or working within a PHO are detailed in Table 5.

Table 5. Individual and PHO responsibilities for respiratory hygiene and cough etiquette

Responsibilities of the individual	Responsibilities of the PHO
<ul style="list-style-type: none"> • Do not cough into bare hands. Instead, cough into a tissue or elbow. • Perform hand hygiene after contact with respiratory secretions and contaminated objects or materials. • If a patient is coughing or sneezing during transportation or in common waiting areas, a surgical mask should be worn if clinically possible. • If coughing, sit \geq 1m from others in common areas. • Inform clinicians about any respiratory signs or symptoms. • HCW with a persistent cough or signs and symptoms of a respiratory infection should: <ul style="list-style-type: none"> - seek medical advice; - practise respiratory hygiene and cough etiquette; - absent themselves from work as necessary (see Section 2.5, <i>Staff health and HAI risk</i>) 	<ul style="list-style-type: none"> • Reinforce the importance of hand hygiene and provide access to hand hygiene amenities. • Display signage that instructs patients and visitors on respiratory hygiene and cough etiquette. • To minimise transmission to high risk patients, a PHO may prohibit a coughing or sneezing visitor from attending certain areas of the PHO. • Ensure the availability of resources to support respiratory hygiene and cough etiquette in waiting areas for patients and visitors (e.g. tissues, waste bins) • Provide surgical masks to persons who are coughing in waiting areas. • If a visitor is coughing or sneezing, the visitor should be discouraged from attending the PHO or should wear a surgical mask. • Ensure that HCWs have access to appropriate PPE and are provided training in the use of PPE. • Employ a risk assessment system for the management of coughing HCWs, particularly those HCWs working in areas with vulnerable patients, such as neonatal intensive care units (NICUs), paediatric units and haematology units.

4.9 Safe handling and disposal of stock, linen and waste

4.9.1 Storage of sterile, clean and reprocessed sterile stock and equipment

Sterile items are to be stored and handled in a manner that is in accordance with manufacturers' instructions and that maintains the integrity of the packaging material and prevents contamination of the contents. Packaging of sterile items should not be disfigured, left opened or be held together with tape, elastic or paper clips.

Sterile stock is to be stored out of direct sunlight, in dedicated sterile stock storage areas that are cleaned to a routine schedule and are free from dust, insects and vermin. New or reprocessed stock is to be stored in a designated clean and dry room/area and stored in such a way that prevents contamination and maintains the level of any prior reprocessing.

Preferably sterile stock should be stored in wire baskets. However, if in plastic tubs, the tubs should be regularly emptied and cleaned.

Sterile stock should be stored at a height of 440mm from the ceiling and 250mm above the floor. If the packaging of a sterile item becomes compromised by moisture or damage, the stock must be considered unsterile. If unsterile stock cannot be reprocessed, stock should be disposed of immediately. If unsterile stock can be reprocessed, the stock should be repackaged and reprocessed again before any use.

The PHO is responsible for ensuring that a stock rotation procedure and policy is in place. Stock levels should be maintained to meet the needs of the clinical area while not compromising stock sterility or wastage.

Designated dirty utility (pan) rooms are to have clear separation of clean and dirty workflows to avoid contamination of cleaned equipment and to prevent contaminated equipment from being placed in the clean work area. The ideal dirty utility (pan) room will have purpose built storage spaces to store clean stock and equipment to avoid any contamination. Dirty utility (pan) rooms are to be maintained in a clean dry state with uncluttered work surfaces and with all items stored off the floor. Towels or sheets are not to be used as covers for the benchtops. A program for the routine cleaning of shelves and storage compartments is to be established and records maintained. HCWs should be made aware of the local routine cleaning program, including correct use of general cleaning products (e.g. neutral detergent impregnated wipes) and an awareness of who is responsible for ordering stock when they are low. Unauthorised people should not have access to the dirty utility room.

AS/NZS 4187:2014

Reprocessing of reusable medical devices in health service organizations

AS/NZS 4815:2006

Office-based health care facilities - Reprocessing of reusable medical and surgical instruments and equipment, and maintenance of the associated environment

See [Section 8](#), *Reprocessing*.

See [Australian Guidelines for the Prevention and Control of Infection in Healthcare B1.5.6](#) for advice on storage and maintenance

Table 6. Examples of items to be stored in designated clean storage rooms and dirty utility rooms

Examples of clean items to be stored in designated clean rooms or areas	Examples of clean items to be stored in designated dirty utility or clean up rooms
<ul style="list-style-type: none"> • Medical equipment • (e.g. infusion pumps, blood pressure machines, computer on wheels) • Medical and administrative supplies • Wheelchairs • Walking aids • Plastic bed sheets or 'blueys' (disposable water proof sheets) • Indwelling urinary or suprapubic catheter holders • Spare beds • Incontinence pads • Bed slings (if not stored with clean linen) • Patient personal hygiene products • Unused sharps containers • Emesis bags • Surgical hair removal clippers 	<ul style="list-style-type: none"> • Bedpans & Urinals • Patient wash bowls • Urine testing equipment • Linen skips and waste bins • Access to PPE for the purpose of the tasks performed in the dirty utility (this area is not for storage of PPE) • Pan covers • Vases • Rubbish bags

4.9.2 Clean linen

Clean linen is to be stored:

- in a clean, dry place that prevents contamination by aerosols, dust, moisture or vermin
- on clean, washable shelves and, if necessary, wrapped in a protective covering;
- separately from used linen; and
- in a manner that will allow for stock rotation.

AS/NZS 4146:2000
Laundry practice

Clean linen and used linen are not be transported together unless separated by a suitable barrier

4.9.3 Handling and disposal of used linen

There is a potential risk of disease transmission via exposure to contaminated linen [107, 108]. Therefore, HCWs should handle, dispose and process used linen or linen soiled with blood or other body substances in a manner that prevents exposure to skin and mucous membranes, contamination of clothing and transfer of microorganisms to other persons and the environment. Used, soiled or wet linen should be placed into linen bags at the point of generation; the handling of the linen should be minimised as much as possible. Clear leak-proof bags are to be used to contain linen that is heavily soiled with blood, other body substances or other fluids (including wet with water). Linen bags should not be filled completely as this will increase the risk of rupture in transit and injury to bag handlers.

Used or soiled linen are not to be rinsed or sorted in patient care areas or washed in domestic washing machines. Domestic type washing machines are only to be used to launder a patient's personal items and only one patient's personal items can be washed per cycle. All patient care and facility linen is to be washed using non-domestic washing machines. Washing machines are to be housed in suitably designed rooms with a clean and dirty workflow.

[NSQHS Standard 3.15](#)

Using risk management principles to implement systems that maintain a clean and hygienic environment for patients and HCWs

AS/NZS 4146:2000

Laundry practice

Each PHO is to have a written policy and/or procedures on the collection, transport, and storage of linen. Furthermore, a PHO that processes or launders linen in-house will also have documented policies and/or procedures consistent with AS/NZS 4146:2000 Laundry Practice.

4.9.4 Patient zone privacy curtains

A PHO may use privacy curtains to separate individual patients. Such curtains should be installed to ensure that there is total coverage when the curtains are drawn closed (i.e. no open gaps are present).

Patient zone privacy curtains are to be either made of a washable or disposable material. Washable privacy curtains should be changed and washed according to the Environmental Cleaning SOP (module 3.2.3.10).

[NSW Health PD2012_061](#)

Environmental cleaning policy

The frequency of washing is to be determined by applying the functional risk rating of the clinical area, as outlined in the NSW Health *Environmental Cleaning Policy* ([PD2012_061](#)). If the curtain (washable or disposable) is visibly soiled, it should be changed as soon as practical.

[Environmental Cleaning SOP](#)

Module 3.2 Furnishings and Fixtures

Disposable privacy curtains are marked with an expiry date and should be disposed of in accordance with manufacturer's instructions and NSW waste management guidelines. Non-disposable privacy curtains are to be changed as part of terminal cleaning.

4.9.5 Dedicated window curtains and blinds in clinical areas

Before purchasing and installing window curtains (with or without additional backing) and blinds in clinical areas, the PHO should consider the cleaning requirements for these furnishings (see [Section 2.4.1](#), *Purchasing new equipment*).

[NSW Health PD2012_061](#)

Environmental cleaning policy

[Environmental Cleaning SOP](#)

Module 3.2 Furnishings and Fixtures

The PHO must clean these furnishings in accordance with the NSW Health *Environmental Cleaning* policy ([PD2012_061](#)).

4.9.6 Waste disposal

Proper containment of waste can minimise the transmission of infection [109]. See NSW Health *Clinical and Related Waste Management for Health Services* Policy Directive ([PD2017_026](#))

[NSQHS Standard 3.15](#)

Using risk management principles to implement systems that maintain a clean and hygienic environment for patients and HCWs

[NSW Health PD2017_026](#)

Clinical and Related Waste Management for Health Services

4.9.7 Clinical waste disposal in the community

Clinical waste should be handled in a manner consistent with standard precautions (see [Section 4, Risk mitigation: Standard precautions](#)). In a client's home, clinical waste generated should be disposed of at the point of use. Sharps are to be disposed of in sharps containers.

[NSW Health PD2017_026](#)
Clinical and Related Waste
Management for Health
Services

Used aprons, gowns and gloves in both clinical and non-clinical community health settings are classified as general waste. Any bulk fluids should be emptied into domestic sewerage systems. Other clinical waste, such as closed system surgical drains, wound exudate collection canisters from vacuum-sealed systems and self-contained chest drainage collection systems that cannot be emptied into domestic sewerage systems, is to be double-bagged and disposed of at point of use.

4.10 Safe handling and transport of patient specimens

When transporting and handling pathology specimens, HCWs should ensure that the specimens are packaged and transported in such a way to ensure the safety of anyone required to handle the package and/or specimen and that the specimen is maintained under suitable conditions [16].

[National Pathology Accreditation Advisory Council](#)
Requirements for the Packaging and Transport of Pathology Specimens and Associated Materials (Fourth Edition 2013)

As a minimum, the following infection prevention and control principles are to be observed during the transportation of specimens:

- transport specimens to the pathology laboratory as soon as possible;
- if transporting specimens by foot or trolley, double packaging of the specimen is required, e.g. the primary receptacle placed in a secondary packaging of appropriate shape, leakproof and of sufficient volume to contain a spill
- contain specimens in a canister/capsule prior to sending via a pneumatic tube specimen delivery system; and
- do not use pneumatic tube specimen delivery systems when transporting highly pathogenic or novel infectious specimens.

In the event of a novel infectious disease, PHOs should refer to specific handling and transporting advice provided by NSW Health or other delegate agencies (e.g. [NSW Contingency Plan for Viral Haemorrhagic Fevers \(GL2016_002\)](#))

4.10.1 Transport between locations

Where a PHO is required to transport specimens to a pathology laboratory by road, rail or air transport, triple packaging is to be used. Specimen packaging is to comply with the relevant standards and requirements for the mode of transport being used.

AS 4834-2007
Packaging for surface transport of biological material that may cause disease in humans, animals and plants

[Civil Aviation Safety Regulation Part 92](#)
Consignment and carriage of dangerous goods by air

4.11 Other controls required in all patient settings

4.11.1 Food

To ensure that food is fit for human consumption it is important that the principles of food hygiene are followed by all those who are involved in the preparation, handling and serving of food.

All PHOs are regulated by the NSW Food Act 2003 and are to be licensed by the NSW Food Authority. PHOs must comply with the Food Standards Australia New Zealand Standard Code 3.3.1 Food Safety Programs for Food Service to Vulnerable People.

High risk patient groups

All patients in healthcare facilities are at risk of acquiring a foodborne illness if food safety standards are not maintained. Even if food safety is not compromised, certain patients are more vulnerable to serious infection from certain foods. These patients include: pregnant women, young children, the elderly and the immunocompromised (e.g. diabetes, immunosuppressive treatments, leukaemia). Seek dietary advice from local dietetics services prior to providing food to these individuals.

Food provided by the hospital (or other PHOs)

Food Standards Australia New Zealand Standard Code 3.3.1 outlines the local governance structures and processes required for:

- Food storage requirements and temperature control;
- Food sanitation;
- Stock rotation and food expiry;
- Cleaning of food preparation areas and equipment; and
- Documentation.

At the ward level, the following practices are advised for implementation:

- Serve hospital-provided food immediately after its preparation.
- Storage of uneaten or partially uneaten meals is prohibited. Uneaten meals are to be disposed of after the meal service.
- Use enteric feeds immediately after opening. Dispose of any feeds that have been exposed to the environment (e.g. left sitting open on benchtops).
- Store hospital-provided food in a designated patient food storage refrigerator (See below for advice on storing externally brought food).
- The ward-based kitchen and beverage preparation areas (including designated patient food storage refrigerators) should not be considered or treated as a main access thoroughfare for clinicians, patients or visitors. Before implementing any access restrictions, PHOs should consider the need for patient and/or visitor access. For example:
 - Settings where patient access to the kitchen is imperative for their health and recovery (e.g. mental health settings, occupational therapy, rehabilitation)
 - Settings and/or occasions where patients, particularly those hospitalised for a long period, may communally gather in the kitchen (e.g. celebrations)
- Good hand hygiene practice should always be employed when preparing and handling food.
- Safe and appropriate handling practices should be used when

[Food Act 2003 No 43 \(NSW\)](#)

[NSW Health PD2011 078](#)
Nutrition Care

[Australia New Zealand Food Standards Code - Standard 3.3.1](#)
Food safety programs for food service to vulnerable persons

[ACI Nutrition Network](#)
Nutrition Standards and Diet Specifications

[ACI Nutrition Network](#)
Food and Nutrition in NSW Hospitals

[NSW Food Authority](#)
Guidelines for food service to vulnerable persons

[NSW Food Authority](#)
Special Care Foods

preparing eggs, raw meat, poultry, noodles, cheeses and fruit and vegetables.

- Dedicated refrigerators should be available to separately store:
 - Patient food and beverages
 - Staff food
 - Medication and vaccines (Refrigerator should be outside of food preparation areas)
 - If required, medical equipment (Refrigerator should be outside of food preparation areas)
- Refer to the NSW Health *Maternity - Breast Milk: Safe Management* Policy Directive ([PD2010_019](#)) for advice on the storage of breast milk.

[NSW Health PD2010_019](#)
Maternity - Breast Milk: Safe Management

Food not provided by the hospital (or other PHOs)

Food brought into hospitals by patients and their families and carers is outside the scope of this handbook. This includes foods brought from commercial food outlets on the hospital campus (e.g. takeaway shops and convenience stores). However, HCWs should inform patients, families and carers that wards do not have the capacity to store food that has not been provided by the hospital and cannot guarantee the integrity and preservation of externally bought foods. HCWs should seek dietetic advice regarding the risks associated with consuming externally brought food.

[ACI Nutrition Network](#)
Food and Nutrition in NSW
Hospitals

HCWs should not purchase, reheat, prepare or serve any externally brought food on behalf of patients.

Oral nutritional supplements

To prevent contamination, portion controlled nutritional supplements should be dispensed in a clean environment. The full portion should be consumed when given. If the full portion is not consumed within 2 hours, it is to be discarded.

Opened supplement containers or cans must be labelled with the date and time opened, covered and stored in a patient food storage refrigerator. Use the contents or discard within 24 hours of opening.

Food consumption by HCWs

HCWs should avoid eating or drinking in clinical areas, such as ward stations and perioperative settings. Food and drink should be consumed in designated staff tea rooms.

4.11.2 Flowers and plants

For the vast majority of patients in hospitals and other healthcare facilities, fresh flowers or potted plants do not represent a risk of infection [110]. Cut flowers left standing in water and soil from plants and dried arrangements can be heavily contaminated with microorganisms that are pathogenic to immunocompromised patients, such as *Aspergillus* sp. [111]. While there is limited evidence that links the presence of these organisms to infection in these patients [110], it is strongly recommended that plants and dried or fresh flowers are not allowed in the hospital rooms of haematopoietic stem cell transplant recipients given the potential for severe infection in these patients [3, 112, 113].

4.11.3 Staff attire

HCWs are to wear clean garments. HCWs who wear long sleeved clothing should roll up long sleeves or remove long sleeved clothing in a clinical area to not impede hand hygiene. Requests from HCWs to wear long sleeved garments for religious or medical reasons (e.g. compression bandages) should be assessed by the PHO on a case by case basis. Refer to [Section 4.1.4, Jewellery](#), for information regarding jewellery.

[NSW Health PD2012_057](#)
Uniforms Policy

HCWs must wear fluid repellent, fully enclosed shoes in the clinical environment.

It is recommended not to wear ties and lanyards in the clinical setting. Evidence suggests that ties and lanyards can be contaminated during patient care, and in turn can carry infectious material between patients [114-116].

Surgical attire

Surgical attire should not be worn outside of the perioperative environment [117], unless emergency attendance of a patient is required. Visibly soiled scrubs are to be changed before leaving the theatre. If scrubs are worn outside of the perioperative setting, surgical attire is to be changed before re-entry into theatre. Use of outer gowns to protect surgical attire is not recommended, due to the limited benefit in reducing the contamination of surgical attire [118].

There is limited evidence for the use of shoe covers to reduce microbial load in the theatre environment [119]. Where the use of shoe covers is indicated, HCWs perform hand hygiene after putting on and removing shoe covers.

SECTION 5

RISK MITIGATION: TRANSMISSION-BASED PRECAUTIONS

“Since the infecting agent often is not known at the time of admission to a healthcare facility, Transmission-Based Precautions are used empirically, according to the clinical syndrome and the likely etiologic agents at the time, and then modified when the pathogen is identified or a transmissible infectious etiology is ruled out.”

Siegel et al, 2007 [3]



Transmission-based precautions should be used when standard precautions alone are insufficient to interrupt the transmission of a microorganism. **Transmission-based precautions are to be applied in addition to standard precautions.** There are three types of transmission-based precautions, tailored to the different forms of transmission:

- Contact precautions;
- Droplet precautions; and
- Airborne precautions.

To support the requirements of transmission-based precautions, a PHO is responsible for providing its staff, patients and visitors with recommended PPE. The PHO should also provide suitable accommodation and patient care equipment and ensure that healthcare workers (HCWs) are trained in the use of PPE and patient care equipment.

[NSQHS Standard 3.11](#)
Implementing systems for using standard precautions and transmission-based precautions

[Section 4](#)
Risk Mitigation: Standard Precautions

[Work Health and Safety Regulation 2011](#)

If an infectious disease is suspected, HCWs should apply appropriate transmission-based precautions as soon as possible and maintain these precautions until a definitive diagnosis (including pathology results) has ruled out the possibility of an infectious disease or until effective treatment has been commenced and continued for the appropriate period of time. HCWs should be aware that there will be, however, certain instances where it may not be possible to identify all patients for whom contact, droplet and airborne precautions are required. For example, the risk of a transmission may be present before symptomatic illness is observed or a definitive diagnosis can be made [120, 121].

Any triaging of patients suspected of an infectious disease should occur in a manner that prevents contamination of the environment and transmission in waiting rooms. Patients suspected of having an infectious disease should be moved from public waiting rooms to a single patient accommodation or cohort area while awaiting treatment. If transfer or transport of the patient is required, transferring/transport agency should be informed of the transmission-based precautions on booking.

[NSQHS Standard 3.12](#)
Assessing the need for patient placement based on the risk of infection transmission

Each PHO should address the need for visitor restrictions. At a minimum:

- Visitors are encouraged to practise hand hygiene. Visitors are not routinely required to don PPE, unless exposure to blood or body substances is anticipated.
- Any visitor attending a patient in isolation are to be advised that they should not subsequently visit any other patient in the hospital during the same visit; and
- Parents should be advised to refrain from taking infants in to visit patients who are being cared for in isolation.

[NSQHS Standard 3.6](#)
Developing, implementing and monitoring a risk-based workforce immunisation program in accordance with the current NHMRC immunisation guidelines.

If variation from these requirements is necessary, the local infection prevention and control unit should be consulted prior to the visit.

[NSQHS Standard 3.7](#)
Promoting collaboration with occupation health and safety programs to decrease the risk of infection or injury to HCWs.

5.1 Contact precautions

Contact precautions, when used with standard precautions, are designed to reduce the risk of transmission of microorganisms by direct and/or indirect contact.

[Section 1.2.1](#)
Contact Transmission Routes

Specific requirements for contact precautions:

- Preferably, patients should be placed in a single room with ensuite bathroom. If not possible, patients should be cohorted with patients infected or colonised with the same microorganism and have access to a designated bathroom.
- HCWs should perform hand hygiene, put on apron/gown and gloves on entering the patient area. All staff entering the patient area are to wear PPE because of the unpredictable nature of patient care staff will not know if and when they may be required to touch the patient or their environment.
- Preferably, patients should be transferred or transported on their own. If not possible, cohort with patients infected or colonised with the same microorganism. If that is not possible either, ensure that physical separation of patients can be achieved in the transport vehicle. Physical separation is ensured when patients can neither touch each other nor common environmental surfaces.
- Depending on the microorganism, terminal cleaning with a disinfectant may be required. Use [contact precautions](#) signage at entrance of patient's zone.

HCWs are to wear a P2/N95mask if aerosol generating procedures are anticipated. Protective eyewear should be worn as part of standard precautions.

5.1.1 Contact precautions in specific settings

- **Neonatology and other extreme risk rated units:** Consider restricting HCWs with an active HSV infection from providing direct patient care in neonatology units and other units as per [Section 2.5.6](#), *HCWs with herpes simplex virus*.
- **Community-based outbreak settings (including oral health):** Contact precautions for the management of MRO colonised or infected patients may not be indicated.

[Section 7](#)

Risk mitigation: precautions for multi-resistant organisms and *Clostridium difficile*

5.2 Droplet precautions

Droplet precautions should be employed in addition to standard precautions when caring for any patient known to be or suspected of being infected with a microorganism that can be transmitted by the droplet transmission route.

[Section 1.2.2](#)

Droplet transmission route

Specific requirements for droplet precautions are:

- Preferentially, the patient should be placed in a single room with ensuite bathroom. If not possible, the patient should be cohorted with patients infected or colonised with same microorganism and have access to a designated bathroom [122]. Maintain a spatial separation of greater than 1m between cohorted patients [2, 3] or draw bed curtains between patients to impede the direct spread of droplets and space beds at least 1m apart [122].
- HCWs are to wear a fluid repellent surgical mask. Masks should be removed and disposed of on leaving the patient's zone (e.g. at the door, curtain or the anteroom).
- Protective eyewear (goggles or faceshield) is to be worn as part of standard precautions if working within 1m of the patient.
- If a patient who is being cared for under droplet precautions requires an aerosol generating procedure (AGP), this procedure should be undertaken in a dedicated treatment room away from other patients.
- Transfer or transport of patient on their own or with patients infected or colonised with same microorganism.
- If clinically able, patient should wear surgical mask when outside of the usual patient zone (including outpatient and emergency settings) [122-125]. Refer to [Section 5.4.1](#), *Surgical masks*.
- Depending on the microorganism, secondary cleaning with a disinfectant may be required.
- Visitors are recommended to wear a surgical mask and protective eyewear if within 1m of patient and practise hand hygiene.
- Use [droplet precautions](#) signage at entrance of patient's zone.

Given that droplets do not remain suspended in the air, special air handling and ventilation is not required under droplet precautions.

If aerosol generating-procedures are anticipated, a P2/N95 mask should be worn by attending HCWs. Protective eyewear should be worn as part of standard precautions.

5.3 Airborne precautions

Airborne precautions are designed to interrupt the airborne transmission route. Airborne precautions should be employed in addition to standard precautions when caring for patients who are known or suspected to be infected with a microorganism that can be transmitted by the airborne route.

[Section 1.2.3](#)

Airborne Transmission Routes

Specific requirements for airborne precautions are:

- Preferably, the patient should be placed in a negatively pressurised single room with ensuite bathroom. If not possible, place the patient in a single room with door closed and window open (if available). In this second instance, the patient should have access to an ensuite or designated bathroom.
- HCWs and visitors are to wear a P2/N95 mask on entering the patient's zone. Masks should be removed and disposed in the anteroom or outside the patient's room.
- Transfer or transport of patient on their own or with others colonised with same microorganism.
- If the patient can tolerate wearing a surgical mask, this should be worn when outside of the isolation zone (including transport, outpatient and emergency settings) [122-125]. Refer to [Section 5.4.1](#). Patients on oxygen therapy must be changed to nasal prongs and have a surgical mask over the top of the nasal prongs for transport (if medical condition allows). Patients are never to wear a P2/N95 mask.
- Depending on the microorganism, terminal cleaning with a disinfectant may be required.
- A period of 30 minutes is required between room occupancy and terminal cleaning [126].
- Use [airborne precautions](#) signage at entrance of patient's zone.

If aerosol-generating procedures are anticipated, a P2/N95 mask should be worn by attending HCWs. Protective eyewear should be worn as part of standard precautions.

5.3.1 Airborne precautions in specific settings

Requirements for airborne precautions in specific settings are detailed below:

- If a sputum-inducing procedure is being performed, such as sputum induction, chest physiotherapy or bronchoscopy, then all HCWs in the room should don P2/N95 masks and use standard precautions, including protective eyewear.
- Sputum inducing procedures should be performed in a Type 5/Class N (respiratory isolation) room (or sputum induction booth). The patient should be left in the Type 5/Class N room or booth until coughing subsides. Other patients and staff not wearing P2/N95 mask should not enter the Type 5/Class N room or booth until enough time has passed for a sufficient number of air exchanges to occur for adequate removal of contaminated air. Consult with facility engineers to determine the air changes per hour for each room/booth.
- Type 5/Class N air handling requirements provide negative pressure relative to the corridor and adjacent areas. Ideally (and for all new buildings), air from Type 5/Class N rooms should not be reticulated via, or to, any other ventilation system, i.e. it should be a single pass system. The discharge points should be located as far as possible from air-intakes, persons and animals. Where existing facilities do not allow external exhausting, air that is to be recirculated should be directed through high efficiency particulate air (HEPA) filters. The door to the room must remain closed at all times. For Type 5/Class N rooms, air change rates greater than or equal to twelve changes per hour with a minimum of two air changes per hour of outside air, whichever results in the greater air quantity, should be achievable when the filters have reached their maximum pressure drop.

[NSW Health GL2009_006](#)
Tuberculosis - Sputum Induction
Guidelines

HB 260-2003c
Hospital acquired infections -
Engineering down the risk

[Australasian Health Facility
Guidelines](#)
Part D Infection Control

Case study 8 - Mathew's story - It's all about the timing!

A 42 year old gentleman, Mathew, presented to the emergency department at 1000 hrs with fever, cough and rash; he had been unwell for 5 days. On examination he had a fever of 38.9°C, a rash to his face and trunk with some vesicles on his arms, and signs of bilateral pneumonia. He was commenced on IV antibiotics for pneumonia. A note was made in the medical record that the rash may be viral and that this was to be investigated. After being in the emergency department for 8 hours, Mathew was transferred to a 4 bed room on the medical unit. The next day (Day 2) the doctor documented a possible diagnosis of chickenpox but was awaiting laboratory confirmation. Nursing staff noted the entry and waited for the laboratory result.

At 1200 hrs on Day 3 Infection Control was notified of a positive Varicella Zoster Virus (VZV) polymerase chain reaction (PCR) result for Mathew; this was the first notification to Infection Control regarding this patient. Infection Control immediately contacted the medical ward to determine what precautions were in place and to provide direction for what was needed. The ward's NUM reported that Mathew had been in a 4 bed room with standard precautions. Infection Control advised that Mathew needed to be managed using contact and airborne precautions. Infection Control undertook a risk assessment to identify patient, visitor and HCW contacts and follow up was required in both the emergency department and in the medical ward.

What happened?

Chickenpox is a highly infectious virus that is transmitted by contact and airborne routes. Because the appropriate transmission-based precautions were not implemented at the time of suspicion, on Day 1 after examination, many patients and HCWs were exposed to the chickenpox virus. Patients, visitors and HCWs who had been in the same room as Mathew for at least 1 hour [127], in the emergency department or medical ward, had to be checked for their chickenpox immunity. Patients who were not immune and remained in hospital had to be accommodated in a single room with negative pressure during the period of incubation, day 10 after exposure to day 21.

How could it have been prevented?

The presence of fever and a vesicular rash is grounds for suspicion of chickenpox (Varicella) or disseminated shingles (VZV). Had contact and airborne precautions been implemented when a viral cause was suspected, there would have only been a small number of patients and HCWs exposed in the emergency department. Had the triage recognised the presence of a rash and fever as trigger to implement precautions until a complete diagnosis was made, Mathew would have had a surgical mask put on and moved immediately to a single room. HCWs would then have commenced contact and airborne precautions from the initial consult.

Had the doctor on Day 2 or the medical ward nursing staff notified Infection Control when a possible diagnosis of chickenpox was made, that would have prevented at least 24 hours of exposure to patients, visitors and HCWs.

5.4 Personal Protective Equipment (PPE) requirements

Surgical and P2/N95 masks are to be used in accordance with manufacturer's instructions. Any mask is to be disposed of if removed from the face or if the mask becomes damaged, soiled, wet/moist or if

breathing becomes difficult. A mask should not be hung loosely around the neck and should not be re-used.

5.4.1 Surgical masks

HCWs should wear a surgical mask within the operating room or during aseptic procedures, such as lumbar punctures, intra-articular joints, injections or insertion of a central line, as part of standard precautions.

However, in transmission-based precautions the surgical mask is used to:

- (i) Protect the wearer against transmission of disease
- (ii) Protect others in the environment from the patient's infection. If a patient is clinically able to do so, the patient under droplet or airborne precautions should wear surgical masks if outside of their patient zone. If a patient is being cared for under droplet or airborne precautions and requires oxygen therapy, nasal prongs should be used and a surgical mask should be worn over the top of the nasal prongs during any patient transport (if the medical condition allows).

AS 4381:2015

Single use face masks for use in healthcare

HCWs should still wear correct facial protection even if a patient is wearing a surgical or oxygen mask.

Note that surgical masks are also known as procedural masks in some settings.

5.4.2 P2/N95 masks

HCWs are to wear a P2/N95 mask when airborne precautions are required and if aerosol generating procedures are anticipated. Protective eyewear should be worn as part of standard precautions.

Fit testing is a complex process that provides an opportunity for HCWs to correctly identify which size and style is suitable for them and allows them to be trained in the correct use of the mask.

AS/NZS 1716:2012

Respiratory protective devices

See [Australian Guidelines for the Prevention and Control of Infection in Healthcare](#) (Figure B2.2) for advice for putting on and removing a P2 mask

HCWs are to perform a fit check each time a P2/N95 mask is used and prior to undertaking any clinical activity in which a P2/N95 mask is required. Fit checks ensure that the mask is sealed over the bridge of the nose and mouth and that there are no gaps in the seal between the mask and the face. PHOs are to ensure that all HCWs are informed how to perform a fit check.

The procedure for conducting a fit check is:

1. Place mask on the face;
2. Place the headband or ties over the head and at the base of the neck;
3. Compress the mask against the face to ensure a seal across the bridge of the nose;
4. Compress the mask to ensure a seal across the cheeks and the face; and
5. Check the negative pressure seal of the mask by gently inhaling. If the mask is not drawn in towards the face, or air leaks around the face seal, readjust the mask and repeat process or check for defects in the mask.

HCWs who have facial hair (including a ≤ 2 -day beard growth) should be made aware that an adequate seal cannot be guaranteed between the P2/N95 mask and the wearer's face.

5.4.3 Powered-air purifying respirators

A PHO is only to provide HCWs with powered-air purifying respirator devices that comply with the relevant Australian Standards. The PHO is to ensure use of these devices is limited to HCWs who are trained in their use and that manufacturer's instructions for cleaning, decontamination and maintenance are followed. These devices may be suitable for HCWS with facial hair.

AS/NZS 1715:2009
Selection, use and maintenance of respiratory protective equipment

AS/NZS 1716:2012
Respiratory protective devices

5.5 Transmission-based precautions in oral health settings

Compliance with standard precautions, including hand hygiene, cleaning of shared equipment and the patient zone after each patient, and disposal or reprocessing of instruments after each procedure, will reduce the transmission of infections and multi-resistant organisms. The PHO should ensure that patients and carers have access to hand hygiene resources and are enabled to clean their hands before and after appointments.

Contact precautions

If a patient discloses a history of a transmissible infection or colonisation that can be spread by the contact route it is not necessary to place a '[Contact Precautions](#)' sign on the door in an ambulatory or day-surgery oral health facility. Contact precautions require single-use personal protective equipment.

Droplet precautions

Routine oral health treatment should be deferred until the patient is no longer coughing or sneezing and can breathe easily. This will minimise the need for exercising droplet precautions and will also reduce patient discomfort and the risk of intra-oral injury from sharp instruments.

If a patient requires *urgent* dental care and droplet precautions are necessary, a risk assessment is to be undertaken and documented.

Airborne precautions

Routine oral health treatment should be deferred until airborne precautions are no longer required.

If a patient requires *urgent* dental care and airborne precautions are necessary, a risk assessment is to be undertaken and documented. If the procedure is to go ahead on the basis of the risk assessment, the following should be adhered to:

- If possible, schedule patient at the end of the day
- Attend to patient in a single room with the door closed and, if available, negative-pressure ventilation
- HCWs to wear a P2/N95 mask before they enter the room and until they leave the room
- HCWs who are considered protected from measles and VZV (see [Section 2.5](#), *Staff health and HAI risk*) are to provide care for patients with these disease.

Use of pre-procedural mouth rinses and rubber dams will limit the spread of aerosol.

SECTION 6

RISK MITIGATION: PATIENT PLACEMENT

“If you are transferring patients lots of times you are moving bugs around the hospital”
Nursing Times, 2010 [128]

ESTABLISH THE CONTEXT

IDENTIFY INFECTION RISKS

ASSESS THE RISK OF INFECTION

CONTROL THE RISK OF INFECTION

REVIEW EFFECTIVENESS OF CONTROL MEASURES

To ensure the safe and timely placement of a patient with a known or suspected transmissible infection (including multi-resistant organism colonisation), patient placement decisions should be made in conjunction with the patient flow team and local Infection Prevention and Control (IPC) service wherever possible. After hours management of patients should be determined by local procedures. The decision needs to consider the prioritisation of isolation or single rooms or dedicated areas for other important uses beyond the management of infectious diseases, such as providing end-of-life care or ensuring appropriate patient security and safety. Guidance on the factors to consider when making patient placement decisions is included in Table 7.

[Section 7.4.1](#)
Patient placement (MRO)

Table 8 provides a suggested priority list on how to place patients where there are competing priorities for isolation or isolation rooms. This list should be reviewed with the local IPC service or Infectious Diseases (ID) service and, where necessary, adapted according to local needs. More detailed guidance can be found at:

- [NHS Ayrshire & Arran: Isolation Prioritisation Scoring System](#)
- [NHS Greater Glasgow & Clyde: Infection Prevention & Control Priority for Isolation Protocol](#)
- [Centers for Disease Control and Prevention: 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings](#)

If multiple cases of the same priority level are present, consult with the IPC service and/or the ID service where possible, as guidance may be provided based on seasonal outbreaks.

Table 7. Risk assessment guide outlining infection prevention and control considerations for patient placement

RISK FACTORS TO CONSIDER	Source and modes of disease transmission	Clinical predictors of disease transmission	Clinical impact of transmission	Room availability
<p>QUESTIONS TO ASK</p>	<ul style="list-style-type: none"> • Is the disease known to spread from a single source? • Is the disease known to spread person to person? • Is the transmission route known? • Is the disease known to spread via multiple transmission routes? • Has the patient recently travelled overseas and/or received medical care overseas? 	<ul style="list-style-type: none"> • Does the colonised/infected patient present with any clinical factors that would increase the likelihood of transmission? 	<ul style="list-style-type: none"> • If transmitted, will disease cause significant clinical impact to a high risk patient? 	<ul style="list-style-type: none"> • Are single/isolation rooms required for the clinical management of other patients? • Are single rooms with designated toilet facilities available? • Are there other patients infected or colonised with the same species and strain? • Is this an extreme risk rated area*?
<p>THINGS TO LOOK OUT FOR</p>	<ul style="list-style-type: none"> • Suspected or confirmed acute respiratory infection • Public health notification • Diarrhoea • Fever 	<ul style="list-style-type: none"> • Wandering • Cognitive impairment • Incontinence • Diarrhoea • Broken skin • Open wound • Invasive devices 	<ul style="list-style-type: none"> • Neutropenic patients • Transplant recipients 	<ul style="list-style-type: none"> • Patients requiring high security or one on one observation • Patients requiring end-of-life care • Existing cohorts

*See [NSW Health PD2012_061 Environmental Cleaning Policy](#) for functional area risk ratings

Table 8. Suggested prioritisation of resources based on infection risk[#]

Note: Patients with significant neutropenia and transplant recipients may require single room isolation with protective precautions - see [Section 9.1, Immunocompromised patients](#). For patients with cystic fibrosis, see [Section 9.2, Cystic Fibrosis](#).

Priority	Disease or presentation* (in alphabetical order)	Precautions**
FIRST	Chickenpox/disseminated varicella zoster virus	Airborne + contact
	Measles	Airborne
	Pulmonary tuberculosis	Airborne
	Respiratory viruses of concern e.g. Middle East respiratory syndrome coronavirus (MERS-CoV), pandemic influenza	Airborne + contact + droplet
	Viral haemorrhagic fever	Airborne + contact + droplet
SECOND	<i>C. difficile</i> infection	Contact
	Carbapenem-resistant organisms (e.g. carbapenem-resistant Enterobacteriaceae)	Contact
	Infectious diarrhoea [†] including norovirus	Contact + droplet
	Influenza	Contact + droplet
	Meningococcal disease	Droplet
	Mumps	Droplet
	Pertussis	Droplet
	Respiratory syncytial virus (RSV)	Droplet
THIRD	Other multi-resistant organisms as designated by your facility (e.g. MRSA, VRE)	Contact
	Scabies	Contact
	Shingles	Contact

[#] May not be applicable to all facilities - check with your local infection prevention and control service.

* Not an exhaustive list. Contact your local infection prevention and control unit for guidance on other diseases/presentations.

** For precautions recommended for other diseases/presentations, refer to the NHMRC Australian Guidelines for the Prevention and Control of Infection in Healthcare (2010).

[†] Some types of infectious diarrhoea only require contact precautions.

6.1 Patient placement in a single or isolation room

The benefits of single-bed rooms for patient isolation, in terms of minimising transmission of infection, are described in the Australian Guidelines for the Prevention and Control of Infection in Healthcare (2010).

NHMRC

Australian Guidelines for the Prevention and Control of Infection in Healthcare (2010)

Putting a patient in isolation may increase the risk of stress, depression and anxiety [129, 130]. A decision to isolate the patient should be made carefully with a consultation among treating clinicians and the IPC service and/or an ID physician. Where isolation is required, the treating

clinician should clearly explain the reason for isolation to the patient and their carers to minimise feelings of stress, depression and anxiety. Extended periods of isolation require regular assessment by teams involved in patient care. The reason for isolation must be documented in the patient's healthcare records and reviewed by the IPC service.

6.2 Patient placement in a cohort or mixed inpatient area

Where single rooms are not available in a high risk clinical area, cohorting patients with the same confirmed infectious agent may need to occur. A decision to cohort patients should be made carefully with consultation between treating clinicians and the IPC service and/or an ID physician. Once a cohort is established, nursing staff should be dedicated to the infected/colonised cohort. Refer to Table 8 as a guide. If placement in mixed gender accommodation is being considered, refer to the NSW Health *Same Gender Accommodation* Policy Directive ([PD2015_018](#))

In lower risk areas such as rehabilitation units, long term care settings, outpatient day treatment settings or patient transport services, a risk analysis should be undertaken to establish the level of risk and benefit to patient treatment.

Based on local infection prevention and control needs, a PHO may consider using a designated area and equipment to accommodate an infected/colonised cohort in a mixed ward. Identification of a designated area may assist HCWs in maintaining strict standard precautions (and transmission-based precautions, as required) when caring for infected/colonised and non-infected patients who are in close proximity.

[NSW Health PD2015_018](#)

Same Gender Accommodation

[Section 7](#)

Risk mitigation: Precautions for multi-resistant organisms and *Clostridium difficile*

[NHMRC](#)

Australian Guidelines for the Prevention and Control of Infection in Healthcare (2010)

SECTION 7

RISK MITIGATION: PRECAUTIONS FOR MULTI-RESISTANT ORGANISMS AND *CLOSTRIDIUM DIFFICILE*

“A guiding tenet of infection control is to ensure that a patient is never denied quality care as a result of harbouring a resistant pathogen.”

Harris, Paterson & Rogers, 2015[131]

ESTABLISH THE CONTEXT

IDENTIFY INFECTION RISKS

ASSESS THE RISK OF INFECTION

CONTROL THE RISK OF INFECTION

REVIEW EFFECTIVENESS OF CONTROL MEASURES

Patients infected with a multi-resistant organism (MRO) may be at an increased risk of morbidity and mortality and often require increased length of stay in hospital along with additional diagnostic testing and treatment. Because of these reasons, a HAI caused by a MRO often results in an additional cost for the patient and the healthcare system. To minimise MRO transmission and infection, HCWs must ensure that basic infection prevention and control principles, such as standard precautions and antimicrobial stewardship are practised during all patient care. In addition, local risk assessments are to be employed to inform on the use of specific infection prevention measures for the management of MRO colonised or infected patients.

MROs are microorganisms that are resistant to multiple antimicrobial classes. These include methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant enterococci (VRE), carbapenem-producing Enterobacteriaceae (CPE), carbapenemase-producing *Pseudomonas aeruginosa*.

Extended-spectrum beta lactamase-producing enteric gram-negative bacillus (Enterobacteriaceae) are known as ESBLs [132]. The risks of nosocomial transmission from ESBL *E.coli* are considered to be low however other ESBLs should be managed using contact precautions [133, 134].

The recommendations described in this section are applicable to both inpatient and outpatient (e.g. clinic) settings. The recommendations are suitable for routine care, however additional measures may be required in the event of a MRO outbreak.

Knowledge Box : The prevalence and effect of MRSA

In a study of over 300,000 hospital inpatients in the United States, 1% of patients negative for MRSA on admission returned later cultures positive for MRSA, indicating acquisition of MRSA during their hospitalisations. Authors from this study reported that post discharge mortality of this group at one year was 10% higher compared with a carefully matched cohort who had not acquired MRSA [135].

7.1 *Clostridium difficile*

C. difficile is a spore-forming microorganism. The spore is resistant to many disinfectants and antimicrobial agents that are often used in healthcare settings. *C. difficile* often produces toxins that may cause mild to severe gastrointestinal symptoms. *C. difficile* is not a MRO, however given that the risks associated with *C. difficile* are similar to MROs, *C. difficile* will also be considered within the scope of this section.

7.2 Antimicrobial stewardship

A PHO is required to have an antimicrobial stewardship program consisting of a range of strategies and appropriate governance to meet the NSQHS Standards.

NSQHS Standard 3.14
Safe and appropriate antimicrobial prescribing is a strategic goal of the clinical governance system

Promotion of the following principles may be helpful in developing strategies and systems to optimise antimicrobial use:

- Select correct patients for antibiotic treatment, avoiding use where there is no evidence of benefit.
- Prescribe antibiotics (type and dose) as specified by locally-endorsed guidelines or national antimicrobial prescribing guidelines (if locally-endorsed guidelines are not available).
- Document reason for outpatient or inpatient treatment with antibiotics against every prescription.
- Ensure patients with presumptive severe sepsis or septic shock receive treatment within 60 minutes of triage/time of diagnosis.
- Specify a review date for each antibiotic course .
- In almost all situations, confine use of surgical antibiotic prophylaxis to a single perioperative dose in accordance with indications specified by national antimicrobial prescribing guidelines [136].

Restriction of selected antimicrobials is one method of ensuring judicious antimicrobial use [137]. The Clinical Excellence Commission’s *List of Recommended Antimicrobial Restrictions* [138] and fact sheets on managing antimicrobial restrictions in small to medium-sized hospitals [139] or medium to large-sized hospitals [140] are useful starting points for PHOs that are considering this strategy.

[Clinical Excellence Commission](#)
List of Recommended Antimicrobial Restrictions

It is recommended that PHOs that lack local antimicrobial stewardship expertise develop strategies to upskill staff. Investing in training, establishing relationships with other PHOs and providing support networks for staff may support the development of antimicrobial stewardship expertise. The effectiveness of this strategy should be reviewed periodically by the multi-disciplinary committee that oversees antimicrobial stewardship in the PHO.

[Clinical Excellence Commission](#)
Antimicrobial restrictions in small to medium-sized hospitals

[Clinical Excellence Commission](#)
Antimicrobial restrictions in medium to large-sized hospitals

7.3 MRO screening and surveillance

Screening results, as well as any results obtained through diagnostic testing, should be used to inform subsequent infection prevention and control actions. As part of risk identification, any MRO positive pathology report should clearly indicate the presence of a specific MRO. If unclear on the interpretation of pathology results or required infection prevention and control action, clinicians should promptly raise queries with the local clinical microbiology service or infection prevention and control unit for interpretation and guidance.

[NSQHS Standard 3.12](#)
Assessing the need for patient placement based on the risk of infection transmission.

7.3.1 MRO admission screening

There are certain risk factors which promote the transmission of MROs in the healthcare environment. Table 9 outlines these risk factors and requirements for admission screening.

[ACSQHC](#)
Recommendations for the control of Multi-drug resistant Gram-negatives: carbapenem resistant Enterobacteriaceae

Table 9. Specific MRO transmission risks

MRO transmission risk	Is admission screening needed?		
	MRSA	CPE	VRE
Admission to high risk clinical inpatient areas such as surgical or medical wards, from any overseas hospital or a location where there is a known MRO outbreak	YES	YES	YES
Admission to high risk clinical inpatient areas such as surgical or medical wards with recent (past 12 months) overnight admission in an overseas hospital or residence in an overseas RACF	NO	NO	NO
Admission to an extreme risk rated clinical inpatient area, such as an adult ICU, burns, renal dialysis, haematology, oncology and transplant units	YES	YES*	YES*
Transfers from units in other NSW hospitals or residential care settings	Depends on local infection rate		
Admission to or transfer from a NICU with known prevalence or MRO outbreak	Depends on local infection rate		
Presence of a chronic wound or invasive device	Depends on local infection rate		

* According to local risk assessment and priorities

7.3.2 MRO screening specimens

Admission screening for MROs requires the collection of at least one swab set. Swab set requirements are included in Table 10. Seek advice from your local microbiology/laboratory service prior to sampling.

Table 10. Guide to swab set requirements (discuss with laboratory)

Microorganism	Specimen(s) Required
CPE	Rectal* (preferred) or faeces and any wound, ulcer, transcutaneous exit site(s) or urine (if indwelling or suprapubic catheter is present)
MRAB	Rectal* (preferred) or faeces and throat or sputum ± wound, ulcer, transcutaneous exit site(s) or urine (if indwelling or suprapubic catheter is present)
VRE	Rectal* (preferred) or faeces and wound, ulcer, transcutaneous exit site(s) or urine (if indwelling or suprapubic catheter is present)
MRSA	Nose + perineum and wound, ulcer, transcutaneous exit site(s) ± throat
C. difficile	Faecal sample (only loose stool will be tested)

*There must be faeces visible on the rectal swab

Standardised diagnostic methods are to be used when screening for MROs. These methods should be consistent with the international standards for microbiological investigations [141, 142].

7.3.3 MRO screening prior to solid organ donation

The transmission of infection from solid organ donor to recipient during solid organ transplant is a rare event [143, 144]. Despite this low probability, transmission of MROs from an organ donor to a recipient has been documented in recent literature [145] and has occurred in NSW with a catastrophic impact on at least one organ recipient. Transmission to the organ recipient is more likely to occur if the donor presents with symptomatic illness at the time of the procedure [143] and a MRO is involved [146].

In addition to donor screening requirements outlined in NSW Health *Organ Donation After Circulatory Death: NSW Guidelines* ([GL2014_008](#)), the donor is to also be screened for MRSA, VRE, CPE, and any other known MROs in local circulation (e.g. carbapenem-resistant *A. baumannii*, multi-resistant *P. aeruginosa*). Blood cultures should also be collected and screened if the donor is febrile. Screening should be done prior to the pronouncement of death by the facility where the donor is receiving care. Results are to be made available to the facilities caring for intended organ recipients as soon as practically possible.

[NSW Health GL2014_008](#)
Organ Donation After
Circulatory Death: NSW
Guidelines

[Therapeutic Guidelines
2014](#)
Prevention of Infection:
Immunosuppressed patients

Transplant teams and infectious diseases physicians should consider the following when interpreting donor screening results [147]:

- For donors positive for MRSA and VRE:
 - Colonisation with MRSA or VRE, in the absence of infection, does not preclude organ donation.
 - Any infection of the potential allograft precludes organ donation.
- For donors positive for CPE:
 - Donor can still be a candidate for organ donation if infection is still sensitive to carbapenem (i.e. resistance gene is not expressed);

- If the donor's medical team has determined that the donor has deep-seated MRSA, VRE or CPE infection that does not affect the potential allograft, then the donor's medical team should consult with the transplant team regarding:
 - The viability of treating the donor with appropriate antimicrobial therapy prior to transplant; and
 - The need to initiate appropriate antimicrobial prophylaxis to the recipient perioperatively.
- Any bacteraemia precludes organ donation.

7.3.4 MRO screening prior to faecal transplant donation

The use of faecal microbiota transplantation (FMT) has been reported for a variety of indications including severe, refractory, or relapsing CDI, and other non-infectious indications. The donor blood and serum screening protocol has been adapted from guidelines for blood transfusion [148]. PHOs performing FMT should have comprehensive protocols for screening donors.

7.3.5 Healthcare worker MRO screening

Routine screenings of HCWs for MRO colonisation is not recommended. HCWs who are identified, via screening or diagnostic testing, as being colonised or infected with a MRO should be referred to staff health or infection prevention and control for assessment, treatment and management, as per local protocols.

[NSW Health PD2015_049](#)
NSW Health Code of Conduct

[NSQHS Standard 3.7](#)
Promoting collaboration with occupational health and safety programs to decrease the risk of infection or injury to healthcare workers.

7.3.6 Ongoing MRO screening in extreme risk rated areas

Ongoing MRO screening may be necessary in clinical areas where there may be a high risk of transmission or where the clinical impact of MRO transmission would be severe (e.g. dialysis units, haematology units, oncology units, ICUs).

[NSW Health PD2017_013](#)
Infection Prevention and Control Policy

What to screen for should be guided by the same principles as those indicated for admission screening and local infection prevention concerns (see [Section 7.3.1](#), *MRO admission screening*). Where a patient is confirmed to be colonised or infected with a MRO, no further surveillance screening (except for clearance screening) is required for that MRO.

7.3.7 MRO screening in non-extreme risk rated areas

Routine MRO screening should only be done before defined surgical procedures (see [Section 7.6](#)). Outside of extreme risk rated areas, routine MRO screening is not recommended but may be required based on local prevalence, risk assessment, or in response to an outbreak.

7.3.8 MRSA clearance screening

Clearance screening for MRSA may be considered if all of the following criteria have been met:

- The patient has not used any antibiotics or antiseptics specific to the MRO in last three months;
- It has been at least six months since the patient has returned a positive MRO specimen; and

- Patient is no longer receiving care in an extreme risk clinical area (See [Table 9](#), *Specific MRO transmission risks* and also [Section 3.2.1](#), *Hospital environments*).

For patients in general wards, outpatients and community settings, clearance of a MRO is when a patient returns at least two negative swabs sets, collected from the same body sites, on the same day at different times or on separate days (i.e. the two swabs sets are “separated by time”). Only the ICP or ICP designated HCW is to update any infection control alerts in eMR (see [Section 7.5](#)).

Additional practice points to consider:

- For MRSA, clearance can be determined if > 6 months after the last positive MRO culture.
- Subsequent relapse of MRSA carriage after initial clearance may occur at a later time, either due to re-acquisition or resurgence of carriage to a detectable level.
- Clearance screening may be performed after re-admission or as an outpatient provided that the patient has not recently used either an antiseptic body wash or antibiotic that is active against MRSA.
- The presence of any indwelling device or non-intact skin is no longer a contraindication for clearance screening. However, clearance screening should include specimens from these sites if required.

For CPE, VRE and ESBL colonised patients, there is insufficient published scientific evidence to develop a state-wide clearance protocol. A local management plan is suggested to be developed with IPC and ID teams.

7.4 Precautions

In extreme risk rated settings, patients with a MRO, should be cared for under standard and contact precautions (See [Section 5.1.1](#), *Contact precautions in specific settings*).

If any of the risk factors described under [Section 7.3.1](#), *MRO admission screening*, are present:

- Preferably accommodate the patient in a single room with ensuite
- If patient is to leave their room, the patient should don clean clothes and perform hand hygiene before and after leaving area
- Patients may use the therapy pool using standard and transmission based precautions provided they comply with cough etiquette and hand hygiene, have no diarrhoea, uncontrolled faecal incontinence, or wounds that cannot be contained by a waterproof dressing. It is suggested to contact the IPC team to discuss management options for each client.

[Aquatic Physiotherapy Group Australian guidelines for aquatic physiotherapists working in and/or managing hydrotherapy pools.](#)

In the absence of the risk factors described under [Section 7.3.1](#), *MRO admission screening*, a patient in a low risk rated setting (e.g. mental health, rehabilitation) can be cared for under standard precautions plus:

- Can be cohorted with other patients that have the same MRO.
- Patient can freely visit hospital courtyards and coffee shops.
- Patient can use gym and therapy areas at any time, ensuring hand hygiene before and after contact with gym equipment. Multi-use equipment is to be cleaned after every patient use.

- Patient's visitors should comply with hand hygiene requirements and not assist or visit other patients. Visitors are not routinely required to don PPE, unless exposure to blood or body substances is anticipated.

Each MRO patient should, where geographically possible and practical, use a separate toilet facility, and the need for additional environmental cleaning should be assessed.

[NSW Health PD2012_061](#)
Environmental Cleaning Policy

7.4.1 Patient placement

Unless otherwise advised by the local infection prevention and control service, the placement of a patient with a MRO should be done in line with [Section 6](#), *Risk mitigation: patient placement*.

Section 6
Patient placement

Specific risk factors that influence MRO patient placement decisions are:

- Is the patient capable of maintaining their own personal hygiene?
- Does the patient have any discharging wounds that cannot be adequately covered?
- Has the patient had diarrhoea in the past 48 hours?
- Is the patient faecally incontinent?
- Is the patient catheterised or incontinent of urine and has MRO colonisation of the urinary tract?
- For VRE placements, does the patient have any enterostomies?
- For MRSA placements, does the patient have any coincident respiratory infections?

7.4.2 Precautions for community health settings

The precautions required to prevent MRO transmission in a community health setting should be based on a risk assessment which should address the following:

[Section 5.1.1](#)
Contact precautions in specific settings

- Are invasive procedures performed?
- Is direct physical contact with blood, body substances, tissue, infectious materials or surfaces/equipment anticipated?
- Are MRO patients/clients seen by the service?
- Are immunocompromised patients/clients seen by the service e.g. immunocompromised, open wound or invasive devices?

Refer to Figure 3 for additional advice on risk assessing for MRO transmission in community settings.

Additional factors such as duration of appointment, age, setting, patient's/client's compliance with infection control requirements, faecal or urinary incontinence, available resources or outbreak incidents may impact on the level of risk and should be considered when conducting a risk assessment.

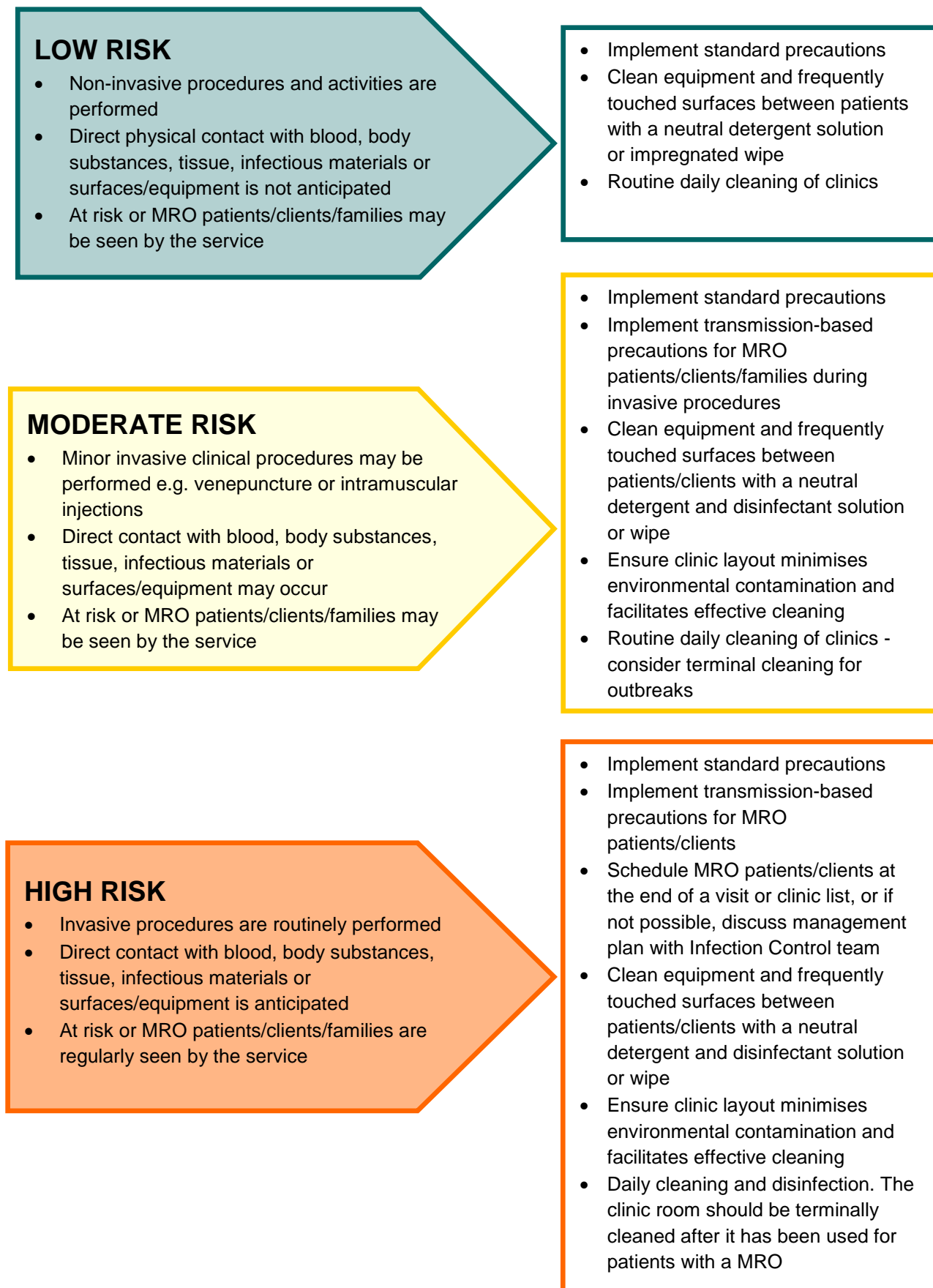
Hand hygiene is to be adhered to by all HCWs who have contact with the patient or patient's surroundings. HCWs should encourage all patients/clients to perform hand hygiene when they attend community health outpatient clinics to minimise environmental contamination.

Standard precautions (see [Section 4](#), *Risk mitigation: standard precautions*) are adequate for activities where HCW contact with the patient is minimal (i.e. only social contact is anticipated), and the risk of MRO transmission is low. Standard and transmission-based precautions (see [Section 5](#), *Risk mitigation: transmission-based precautions*) should be implemented if there is a high risk of MRO transmission. For example, an Occupational Therapist assessing a patient's

home who is known to have VRE and is incontinent of faeces; MRO infected patients/clients attending nursing procedural clinics for wound management.

Reusable/shared clinical equipment and frequently touched surfaces are to be cleaned between patients/clients with neutral detergent. The cleaning process should be as per local protocols and be based on the risk assessment below [Figure 3]. In medium and high risk community settings this may include the additional action of disinfection with hospital-grade disinfectant for reusable or shared clinical equipment and frequently touched surfaces that are in contact with an MRO patient/client.

Figure 3. Risk assessment for community health outpatient settings



For clinics where invasive procedures are performed, it is essential that the layout minimises environmental contamination and facilitates cleaning. This may include:

- Keep clinic surfaces such as desks and floors clear of clutter
- Utilise wall displays or posters that are washable
- Maintain minimal patient care stock in clinic rooms
- Store patient care stock in containers or cupboards after use

At a minimum, all community health clinics are to be cleaned daily when in use. Clinical staff are responsible for cleaning of the patient equipment and touched surfaces, including examination chair/bed and examination light between each patient. An additional terminal cleaning may be required between patients or prior to the start of the next clinic session to minimise the potential for MRO transmission.

7.4.3 Transferring or transporting a patient with a MRO

The transfer and transport of a patient within a hospital or between hospitals is not to be delayed by MRO colonisation or infection and should be guided by clinical need and urgency. Only a minority of patients who are colonised with a MRO will have been identified by screening or a previous infection. Therefore, theoretically, any patient could be colonised.

Transfer or transport agencies are to, as a minimum, exercise standard precautions and, where possible, contact precautions during the transfer and transport of a MRO colonised patient. If this is not possible, refer to local procedures and/or seek advice from the local infection prevention and control unit for alternative arrangements.

It is critical that the transfer/transport agency adheres to all elements of standard precautions, particularly hand hygiene and environmental cleaning, and implements measures to increase the spatial distance between patients during transport/transfer.

The facility booking the transfer or transport is to notify all agencies involved in the transfer or transport, including the receiving PHO, of the patient's MRO status and type of colonising MRO prior to the patient being transferred or transported. The PHO booking the transfer should assist the patient with hand and personal hygiene.

[NSQHS Standard 3.13](#)

Developing and implementing protocols related to the admission, receipt and transfer of patients with an infection.

[NSQHS Standard 3.15](#)

Using risk management principles to implement systems that maintain a clean and hygienic environment for patients and healthcare workers.

7.5 Alerting and removing alerts

Alerting or removing an MRO flag/alert in a patient's healthcare record should only be done by the local infection prevention and control unit or by other HCWs designated by the local infection prevention and control unit. The minimum requirements for alerting and removing alerts for the various MROs, in both inpatient and community settings, are described in Table 11.

Table 11. Requirements for MRO alerting and removing alerts

MRO	Alerting	Removing Alerts
MRSA	Yes	Yes
CPE	Yes	Determine locally*
VRE	Yes	Determine locally*
Carbapenemase-producing <i>P. aeruginosa</i>	Yes	Determine locally*
<i>C. difficile</i>	Determine locally*	Determine locally*
Clinically significant MRO	Yes	Determine locally*
ESBL	Determine locally*	Determine locally*

* Determine based on local prevalence

7.5.1 Recommendations for removing alerts

- A MRO alert should be removed only if the patient meets the criteria for MRO clearance (see [Section 7.3.8, Clearance screening](#)).
- If a patient is cleared of a MRO, there is still potential for a patient to be recolonised with a MRO, including the previous strain of MRO. If recolonisation is detected, MRO flags should be reinstated.
- It is a local decision to use flags or alerts to identify patients with CDI. If alerts are used, the PHO may consider removing alerts on these patients 48 hours after the return of a normal stool pattern (see Table 12). Refer to the national case definition for clarification on what constitutes an acute CDI episode [149].

ACSQHC
National definition and calculation of hospital identified *Clostridium difficile*

7.6 MRSA load reduction and decolonisation

For some patients, reducing the skin burden of MRSA reduces the risk of post-operative infection. To achieve this, clinicians should consider the feasibility of pre-operative load reduction or decolonisation. In the short term, pre-operative load reduction can be considered for some procedures (e.g. cardiothoracic) whereas decolonisation should be used to reduce the risk of recurrent skin infection.

Despite the commencement or completion of any load reduction or decolonisation regimen, a patient is to be considered as colonised and appropriate precautions to counter further transmission are to be maintained until clearance has been microbiologically determined and documented in the patient's health care records.

7.6.1 MRSA pre-operative load reduction

Clinicians should strongly consider the initiation of a pre-operative load reduction regimen for MRSA colonised patients undergoing elective cardiothoracic, orthopaedic (total joint replacements), infrarenal vascular and haemodialysis procedures, particularly in units known to have moderate to high levels of MRSA in circulation. A pre-operative load reduction should be initiated within a sufficient timeframe to optimise efficacy.

This usually requires the regimen to be initiated at least five days prior to surgery. An example regime is included in the next Knowledge Box. However it remains effective if commenced at least one day prior to surgery. Any MRSA pre-operative load reduction regimen should consider local antibiotic formulary restrictions and should be determined in consultation with a clinical microbiologist and/or infectious diseases physician and/or the local infection prevention and control unit. Load reduction can also be performed for MSSA colonised patients; use local protocols for this.

Knowledge Box : Example of a MRSA load reduction regime (to be undertaken in the hospital and home environment)

Duration: Five days prior to surgery and continue after surgery if required. Ideally the full regimen should be completed prior to surgery. If this is not possible, administer as many doses as possible pre-operatively then complete the regimen post-operatively as needed.

Pre-operative load reduction for adults positive for MRSA:

- *Hair and body:* Use antimicrobial bodywash (2% aqueous chlorhexidine or triclosan) when showering. Leave in place for at least 3 minutes before rinsing well. After shower, dry with clean towel.
- *Nostrils:* Treat with 2% mupirocin, three times daily. Apply inside nostril with cotton bud or swab (no further than 2cm deep) and then discard cotton bud. Repeat with new cotton bud or swab for other nostril. Press nose with thumb and forefinger, spread in the nostril using a circular motion.

Treatment for fomites and inanimate objects:

- *Bed linen:* Linen should be changed daily.
- *Personal clothing:* Freshly cleaned clothing and clean footwear should be worn after showering.
- *Frequently touched surfaces:* Wipe surfaces such as bed rails and bedside equipment daily using a clean cloth and detergent. Discard the cloth after use.

This protocol has been adapted from the following sources:

Hunter New England Local Health District, *Policy Compliance Procedure – Management of Multi-resistant Organisms and Clostridium difficile* (2014).
HICSIG – Healthcare Infection Control Special Interest Group. Patient MRSA preoperative local reduction instructions (2015).

7.6.2 MRSA decolonisation

MRSA decolonisation should be limited to the colonised HCWs and patients who have completed treatment for a symptomatic MRSA infection but remain at risk of recurrent symptomatic infection. Decolonisation for MRSA may not be effective if the individual (or other household members if decolonisation is being carried out at home) has an active chronic skin condition or is unwilling or unable to participate in the regime.

MRSA decolonisation **should be considered** only if **all** of the following criteria are met:

- The individual has not used any antibiotics or antiseptics in last two weeks;
- The isolate is susceptible to the decolonisation regimen;
- The individual does not have any invasive devices present;
- All wounds or ulcers have healed;
- The individual does not have any exfoliative skin conditions;
- The individual is cooperative, cognisant and able to follow MRSA decolonisation regimen where required; and
- The patient has completed treatment for MRSA symptomatic infection and decolonisation is expected to prevent recurrent infection.

An example regime is included in the next Knowledge Box. Current evidence indicates that MRSA decolonisation regimens have variable efficacy for long term elimination of MRSA and efficacy is dependent on a number of patient factors [150]. Information should be provided to patients and their carers regarding the expected efficacy of MRSA decolonisation prior to the commencement of any regimen. Where patients and/or carers are to carry out a MRSA decolonisation regimen, clear instructions should be provided to these individuals by the treating clinician.

NSQHS Standard 3.19

Ensuring consumer-specific information on the management and reduction of healthcare associated infections is available at the point of care

Knowledge Box: Example of a MRSA decolonisation regime

Preparation of the individual

- Remove all body piercings for several days prior to commencing decolonisation regime and keep piercings out for the duration of decolonisation.
- Clean earrings and other piercing elements with soap and water and store dry

Preparation of the household

- Replace old toothbrushes, razors, opened roll-on deodorant, skin adhesive tapes, skin creams and solutions, pumice stones, sponges, make up brushes, creams and implements.
- Discard or hot wash all fluffy toys.
- Discard magazines, newspapers and other clutter.
- Wash hair brushes and combs, nail files, plastic toys, and clippers in the dishwasher or discard.

Treatment for adults positive for MRSA (and their household contacts):

- *Hair and body*: Treat with 1% triclosan OR 2% aqueous chlorhexidine daily for 5 days. Apply to skin for at least three minutes and then rinse off. Avoid use of other soaps and bodywashes during this time. Usual shampoo and conditioners are suitable for use.
- *Nostrils*: Treat with 2% mupirocin, twice daily for first week and then 2-3 times a week afterwards. Apply inside nostril with cotton bud or swab. Discard cotton bud after use. Repeat with new cotton bud or swab for other nostril. Spread in nostril by squeezing nose with thumb and forefinger and rubbing together in a circular motion. If the colonising MRSA strain is mupirocin resistant, seek further advice from a clinical microbiologist or infectious diseases physician.
- *Dentures*: Remove dentures early evening and clean with mild soap and water or denture paste. Immerse in a denture cleaning solution every night for 1 hour or as long as prescribed.

Treatment for non-preterm neonates positive for MRSA:

- *Body*: Treat with 1% chlorhexidine cream daily from Day 1 (day of birth) until Day 3. Wipe with water then apply by lightly smearing chlorhexidine cream.
- *Body*: Treat with mild soap and chlorhexidine on alternate days after Day 4. Wash with mild soap and then apply by lightly smearing chlorhexidine cream.

Treatment for household items:

- Disinfect reused personal items with an alcohol-based cleanser (large alcohol-containing wipes) several times during the decolonisation period.
- Clean and disinfect the shower floor and/or bath tub daily with a bleach-based cleanser.
- On days 2 and 5 of treatment, clean the house well (especially the bedrooms and bathrooms). Clean dust off all surfaces then vacuum clean floor surfaces and soft furnishings. Wipe over all frequently touched surfaces with large alcohol containing wipes. Wash vinyl/leather covered furniture with warm soapy water and dry with a clean towel.

Pets:

- Dogs and other companion animals can be colonised with the same strains of *S. aureus* without showing any signs of infection.
- Wash animal bedding in hot wash with laundry detergent and dry in the sun or replace.
- Wash the animal at least once with an antiseptic solution.

This protocol has been adapted from the following sources:

HICSIG - Healthcare Infection Control Special Interest Group. Patient MRSA preoperative local reduction instructions (2015). Hunter New England Health Pathways. Recurrent Staphylococcal Infections. [Online] 2015. <https://hne.healthpathways.org.au/index.htm>.

After the decolonisation regime is completed, the individual should be screened to determine if MRSA clearance has been achieved.

Screening procedures can be worked up locally but at a minimum should address:

- The time-points for screening
- The specimen type(s) required
- The involvement of primary care follow-up
- Alternative strategies to be employed if decolonisation attempts are unsuccessful; and
- If a HCW, workforce management during and after decolonisation.

Repeated decolonisation attempts can lead to the emergence of resistance to the antimicrobial agents used in the regimen. Therefore further advice from a clinical microbiologist or an infectious diseases physician should be sought if MRSA colonisation persists after two attempts at decolonisation.

7.6.3 Decolonisation of other MROs

To date, there is a lack of evidence to support using a decolonisation regimen for the long-term elimination of any other MRO. This section will be updated when reliable and valid evidence emerges to support such regimens.

7.7 Communication about MROs

7.7.1 Communicating with patients and carers

Each PHO is to ensure that clinicians inform and communicate with patients and their carers affected by MRO colonisation or infection and establish an understanding of the necessary infection prevention and control precautions required.

[NSQHS Standard 3.19](#)

Ensuring consumer-specific information on the management and reduction of healthcare associated infections is available at the point of care

Where screening or clinical diagnostic testing has indicated MRO colonisation or infection, the treating medical officer, or their designate, is to advise the patient of this result. This will provide an opportunity to discuss and determine an appropriate management plan and address any concerns the patient, or their carer, may have about MRO colonisation and its potential impact on their health and wellbeing. A PHO should ensure that MRO colonised patients are provided with easy-to-understand written and verbal information on the MRO. At a minimum, this should contain the following information:

- What is a MRO?
- What is the MRO that has colonised the patient?
- What is the difference between colonisation and infection?
- How is the MRO transmitted between individuals or from the environment?
- How long will the MRO be carried?
- How can the patient assist in limiting the spread of the MRO?
- Can the MRO be treated?
- Are other individuals at risk of getting the MRO from the patient?
- What infection prevention and control precautions are required as an inpatient, such as transmission-based precautions, visitor policies and any movement restrictions for patient and HCWs?
- What infection prevention and control precautions are required after discharge (i.e. at home)?
- Who the patient should tell about their MRO colonisation and/or infection (e.g. other healthcare providers including transport agencies).

For [MRSA](#) [151], [VRE](#) [152] and [C. difficile](#) [153] the National Health and Medical Research Council (NHMRC) has produced patient information brochures. For CPE, the Australian

Commission on Safety and Quality in Health Care (ACSQHC) has produced a patient factsheet [154]. It is sufficient to use these brochures and fact sheets for patient communication. Where a PHO has specific local MRO concerns, the PHO may prefer to publish and distribute their own patient information. In the event of an outbreak or increasing endemicity, a PHO must provide rapid response communication and feedback to colonised patients and their carers.

7.7.2 Communicating with other hospitals

As described in [Section 7.4.3](#), *Transferring or transporting a patient with a MRO*, the facility booking a transfer must notify the transport agency and receiving PHO of the patient's MRO status and type of colonising MRO prior to the patient being transferred. If screening or diagnostic results were not available before the transfer, and the presence of a MRO is identified by the booking PHO after the transfer, the booking PHO is responsible for informing the receiving PHO of this new information. The receiving facility is responsible for conveying this new information to the patient and their family or carer.

7.8 MRO outbreak management

The outbreak management principles outlined in [Section 11](#), *Outbreak management*, should be adhered to if an MRO outbreak occurs.

SECTION 8

RISK MITIGATION: REPROCESSING

“Each medical device may be used on hundreds or thousands of patients each year. As such, if there is a problem with the specific medical device that leads to infection transmission, there potentially can be a large number of patients affected.”

Michelle Alfa, 2013 [155]

ESTABLISH THE CONTEXT

IDENTIFY INFECTION RISKS

ASSESS THE RISK OF INFECTION

CONTROL THE RISK OF INFECTION

REVIEW EFFECTIVENESS OF CONTROL MEASURES

Prevention of HAI in patients undergoing dental, medical or surgical procedures is an essential component of patient safety in the delivery of high quality health care. This section provides guidance on how to clean, disinfect and sterilize reusable medical devices (RMDs) prior to and between patient uses. RMDs are designated or intended by their manufacturer as suitable for reprocessing and reuse.

AS/NZS 4187:2014

Reprocessing of reusable medical devices in health service organizations

See [Section 4.9.1](#) for storage of reprocessing stock and equipment

Reprocessing refers to the activities required to ensure that a used RMD is safe for its intended use. It is a multistep process that includes cleaning, inspection and assembly, functional testing (if applicable), disinfection (if applicable), packaging and labelling, and sterilization (if applicable).

PHOs should ensure that staff directly responsible for the reprocessing of RMDs within a facility have relevant qualifications and experience in reprocessing.

PHOs should have in place quality management systems in accordance with AS/NZS 4187:2014 (Section 2, Quality Management).

PHOs should only use cleaning products, instrument grade chemical disinfectants and sterilizing products that are listed on the Australian Register of Therapeutic Goods (ARTG) for reprocessing RMDs. Disinfectants and sterilizing products should only be used for their approved purpose. HCWs involved in the purchase or use of disinfectants or sterilizing products should, prior to purchase, obtain a copy of the TGA listing or registration certificate ([see Section 2.4.1](#), *Purchasing new equipment*).

[Therapeutic Goods Order No. 54 - Standard for Disinfectants and Sterilants](#)

[Australian Register of Therapeutic Goods](#)

After reprocessing RMDs should be stored in accordance with [Section 4.7](#), *Patient equipment - Reprocessing*, and [Section 4.9.1](#), *Storage of sterile, clean and reprocessed sterile stock and equipment*.

8.1 Reprocessing categories and methods

8.1.1 Reprocessing categories

The Spaulding classification system [156] classifies a medical device as critical, semi-critical or non-critical on the basis of risk to patient safety from contamination on a device. The system categorises RMDs according to their intended use and the subsequent level of reprocessing required to render RMDs safe for reuse. Table 14 outlines these categories and includes examples of instruments for each category.

Critical and semi-critical RMDs are typically reprocessed in a designated reprocessing environment. However, it is not uncommon for a non-critical, usually non-invasive, RMD to be reprocessed at the point of use.

Whatever the reprocessing method may be, appropriate validation, control and monitoring of cleaning, disinfecting, sterilization and packaging is essential for reducing the transmission risk associated with the use of RMDs.

Appropriate infrastructure and resources are required to ensure effective and safe reprocessing activities, e.g. provision of quality water and steam; adequately educated and trained sterilizing technicians; and defined and documented work procedures.

8.1.2 Reprocessing methods

In accordance with AS/NZS 4187:2014, the three usual methods for reprocessing are defined as:

- **Cleaning:** The removal of contamination from an item to the extent necessary for further processing or intended use.
- **Disinfection:** Reduction of the number of viable microorganisms on a product or item to a level previously specified as appropriate for its intended further handling or use.
- **Sterilization:** A validated process used to render a product free from viable microorganisms.

Cleaning

Thorough cleaning and removal of visible soil by manual or automated systems is an essential prerequisite for both disinfection (thermal or chemical) and sterilization of RMDs, as residual soil (organic or inorganic) on the RMD surface can interfere with the effectiveness of these processes.

Instruments are to be cleaned either by hand or mechanically, following both manufacturer's instructions and the requirements set by AS/NZS 4187:2014 (refer to [Section 8.1.1](#), *Reprocessing Categories*, to assist with identifying the level of reprocessing required).

Table 12. Reprocessing categories and processes (adapted from AS/NZS 4187:2014)

Application	Process	Examples of items (Lists are not exhaustive)
Critical		
A medical device that comes into contact with the vascular system or sterile tissue and that must be sterile at the time of use.	Clean as soon as possible after use with a detergent solution. Sterilize by moist heat after cleaning If RMD is heat or moisture sensitive, sterilize using an alternative process.	Surgical instruments, diagnostic and interventional radiology catheters, cystoscopies, arthroscopes, biopsy forceps, bronchoscopes*, cardiac catheters, duodenoscopes, ERCP scopes, dental hand pieces, ultrasonic scalars, cardiac and renal intraoperative probes**
Semi-critical		
A medical device that comes into contact with mucous membranes or non-intact skin.	Clean as soon as possible after use with a detergent solution. Sterilize by moist heat after cleaning. If RMD will not tolerate moist heat sterilization use a low temperature sterilization process or thermal disinfection or disinfection using a high level instrument chemical disinfectant.	One-way breathing valves, pneumotachograph screens, mouth shutters, respiratory/sleep therapy equipment, vaginal ultrasound transducers, colonoscopes, gastroscopes, nasoendoscopes and specula.
Non-critical		
A medical device that only comes into contact with intact skin and not mucous membranes	Clean as soon as possible after use with a detergent solution. If necessary, disinfect with compatible low-level or intermediate-level instrument-grade disinfectant after cleaning.	Bedpans, commodes, EEG and ECG leads, blood pressure cuffs, beds and stethoscopes.

*If a bronchoscope cannot tolerate sterilization then high-level disinfection is the minimum level of reprocessing required.

** Intraoperative probes that will have contact with sterile tissue or the vascular system.

The cleaning process should flow in one direction from dirty/contaminated to clean and, ideally the reprocessing of the RMDs should be well clear (if not in a dedicated area) of the contaminated zone.

Disinfection

Disinfection (thermal or chemical) of RMDs kills many pathogenic microorganisms. However, unlike sterilization, disinfection is not effective against high numbers of bacterial spores. Many factors affect the efficacy of a disinfecting process i.e. presence of soil, nature and level of microbial contamination, RMD design, concentration of disinfectant, temperature and exposure time, pH levels and presence of biofilm.

[NSW Health Safety Notice 001/14](#)

Use of Impregnated Chemical Disinfectant Wipe Systems for Reusable Medical Devices

Chemical disinfectants vary significantly in their antimicrobial abilities and speed of action. Specifically:

- Low-level instrument grade disinfectants: kill vegetative bacteria, some fungi and some viruses.
- Intermediate-level instrument grade disinfectants: kill vegetative bacteria, mycobacterium species, viruses and most fungi but do not kill bacterial spores.
- High-level instrument grade disinfectants: kill all microorganisms with the exception of high numbers of bacterial spores. Some disinfectants used as high-level instrument grade disinfectants are chemical sterilizing agents and have the ability to kill high numbers of bacterial spores with prolonged exposure, under controlled and defined conditions.

[Therapeutic Goods Order No. 54 - Standard for Disinfectants and Sterilants](#)

Sterilization

Sterilization destroys all microorganisms on RMDs, rendering them free of viable microorganisms. There are several forms of sterilization and the selected method must be recommended by the RMD's manufacturer. Moist heat sterilization is the preferred process of sterilization of RMDs where the item can withstand the high temperature and pressure of this process. If an item cannot withstand a moist heat sterilizing process, a suitable and validated process alternative will be necessary. An alternative form of sterilization may be a low temperature gas, plasma or liquid chemical sterilizing process and may also depend on resources available within the PHO.

8.2 Reprocessing critical items

8.2.1 RMDs on loan or brought in by clinicians

A PHO cannot verify or assume that privately owned RMDs or loan sets have undergone validated reprocessing prior to receipt at the PHO. If a clinician intends to use privately owned RMDs or loan sets in a PHO, then the RMDs and loan sets (including their containers) should be delivered to the local reprocessing unit with sufficient time for carrying out adequate and validated reprocessing. In addition, clinicians are recommended to liaise with the local reprocessing unit before scheduling procedures. The scheduling of procedures may be influenced by whether additional reprocessing education, training or validation requirements need to be met prior to or after reprocessing and the duration of reprocessing required.

Where a PHO is expected to reprocess privately owned RMDs or loan sets, the PHO's reprocessing unit is to be provided with the following information when receiving the device/sets:

- Manufacturer's name
- Name and contact details for manufacturer's local representative
- ARTG certificate or list number
- Manufacturer's instructions for use.

Without the provision of this information, local reprocessing units will be unable to adequately reprocess privately owned RMDs or loan sets.

To reduce the risk of damage to privately owned RMDs or loan sets during transit to the PHO, instrument containers should be fit

[Work Health and Safety Regulation 2011](#)

for purpose; packaged and transported in a way that prevents damage; and meet the requirements for manual handling of the Work Health and Safety Regulation 2011.

On receipt at the PHO, the local reprocessing unit should examine the integrity of the container. If the integrity of the container has been compromised, then the following actions are required:

- Decant contents of broken container into an intact container
- Remove the broken container from circulation
- Reprocess instruments, regardless of whether the contents have been previously reprocessed
- Report issues to the sponsor and the TGA.

8.2.2 Oral health

The practice of dentistry frequently involves the use of sharp instruments which can pierce skin and mucous membranes during treatment. In dental practice there is a risk of cross-infection as treatment may involve contact with saliva, blood and endodontic pulp tissue. Formal training is required for all personnel who clean and reprocess dental equipment.

[Australian Dental Association](#)
ADA Infection Control Guidelines

Dental instruments can become contaminated with blood, saliva, cement and other dental materials that may be difficult to remove if allowed to dry. Effective sterilization of instruments relies on effective cleaning prior to sterilization. Therefore, dental materials should be removed from instruments at point of use to prevent substances drying on these instruments.

Many of the reusable instruments and burs utilised in oral health services are classified as 'difficult to clean' and require special attention and cleaning.

Oral health services utilising a steam sterilizer to sterilize dental equipment within their unit are to follow the requirements for testing, documentation and quality control as specified by AS/NZS 4187:2014.

Transportation of contaminated oral care instrumentation when being reprocessed outside of the oral health service unit is to be contained within a puncture-proof and lidded container and a process for delivery and pick-up of instruments is to be formalised and documented.

8.3 Reprocessing semi-critical items

8.3.1 Intracavity ultrasounds

Intracavity ultrasound transducers are to be reprocessed in accordance with the manufacturer's recommendations and AS/NZS4187:2014. If an intracavity ultrasound transducer cannot be sterilized, thermal or chemical disinfection is required to minimise the risk of cross contamination and ensure patient safety. The use of disposable covers is not used as a substitute for cleaning, sterilization or disinfection. Fume extraction cabinets may be required while using the recommended chemical disinfectant. Specialised requirements are to be followed when disposing of chemical disinfectants. Approved spill kits are to be available in the reprocessing area in case of spillage of the chemical disinfectant.

[NSW Health Safety Information 001/14](#)
Correct Usage of Fume/Vapour Soaking Stations

Appropriate PPE is to be worn by HCWs when reprocessing ultrasound transducers.

Reprocessing cycle records are to be maintained by the PHO with the following information as a minimum: transducer serial number; date and staff members responsible for reprocessing; method

of disinfection; disinfection cycle or load number; name and signature of the person releasing the transducer for use. If using chemical disinfection, batch information, preparation date and use by date of the chemical disinfectant should be documented. Any failed cycles or interruption during the disinfection process are to be documented and the transducer fully reprocessed prior to use. In addition, chemical indicators are to be used to validate concentrations and/or holding time and documented as recommended by the chemical disinfectant manufacturer.

To ensure HCW safety and reduce the risk of damage, contaminated ultrasound transducers are to be transported to the reprocessing area immediately after use, in a closed container that can be effectively cleaned. Containers are to be thoroughly cleaned and dried between uses.

Reprocessed ultrasound transducers are to be stored in a clean environment to maintain the sterilization or disinfected process. Each sterilized or disinfected ultrasound transducer is to have an indicator attached to confirm that appropriate reprocessing methods have been followed.

8.3.2 Cleaning of flexible endoscopes

For advice on cleaning of flexible endoscopes, see NSW Health Safety Notice SN:002/06.

[GESA](#) Position Statement –
March 2017: Infection
Control in Endoscopy

[NSW Health Safety Notice
SN: 002/06](#)
Cleaning of flexible
endoscopes (reprocessing)

8.4 Reprocessing non-critical items

8.4.1 External ultrasounds

Medical equipment, including bladder scanners, ultrasound machines and transducers may act as both a source and a vector of nosocomial infection. Under certain unfavourable circumstances ultrasound gel can also become contaminated with a variety of microorganisms and can cause cross infection. The advice below relates to ultrasound probes/transducers and associated equipment used by health care workers on intact skin. This section does not provide advice on probes used to enter sterile tissue, the vascular system or that come into contact with mucous membranes or non-intact skin. Ultrasound transducers used for imaging the vascular system for insertion of venous access devices are included in this section, as are bladder scanners.

An ultrasound probe used on intact skin is classified as a non-critical piece of equipment. After use it requires cleaning and, depending on the outcome of a risk assessment, low level disinfection.

8.4.2 Surface probes used on intact skin and bladder scanners

Following a non-invasive procedure, e.g. scanning over intact skin or bladder scan, all gel is to be removed from the probe and the transducer probe is to be cleaned with a neutral detergent and, if required, disinfected with an appropriate hospital grade disinfectant in compliance with the manufacturer's recommendations and TGA regulations. The cleaning procedure should include the entire cable from the transducer to the machine and extend to the surface of the machine.

If an ultrasound transducer or associated equipment comes in contact with blood and/or body fluids, first clean with a neutral detergent and then disinfect with an appropriate hospital grade disinfectant in compliance with the manufacturer's recommendations and TGA regulations.

8.4.3 Ultrasound devices for insertion of venous access or biopsy

Ultrasound transducers used for imaging the vascular system for insertion of venous access devices should be used with a sterile probe cover and sterile gel. If the probe cable is likely to come into contact with a sterile drape, e.g. during insertion of a central access device, the cable should be covered with a long sterile sheath and be managed in such a way as to maintain the sterility of the procedural region. Following use, the cable cover is to be removed without contaminating the surface of the cable or the ultrasound machine. The cable should now be processed as per [Section 8.4.1](#), *External ultrasounds*.

8.4.4 Stethoscopes

Auscultation of the heart, lungs, abdomen, and major arteries with a stethoscope has long been considered an integral part of the physical examination and most clinicians prefer to use their own stethoscope [157]. Evidence suggests that stethoscopes are potential vectors for microorganism transmission between patients [158, 159]. *S. aureus* has been identified surviving on ear pieces of stethoscopes for longer than 18 hours [160]. All parts of the stethoscope that have been in direct contact with skin (patient's or clinician's) should be cleaned before reuse. In extreme risk clinical areas, or during outbreaks, HCWs should consider using Single Patient Use stethoscopes [157].

8.4.5 Toys

Toys are potential vectors for fomite transmission and are reservoirs for microorganisms [161, 162]. Toys and items that are handled, placed in children's mouths or used in baths are to be washable, quick drying and easy to clean. PHO should not purchase or encourage the use of water-retaining bath toys, non-washable soft toys and other toys which are difficult to clean. If such toys are brought into the PHO by the patient or their visitors, use should be limited to a single patient only.

NHMRC

Staying Healthy:
Preventing infectious
diseases in early childhood
education and care services
(5th edition)

Used toys and therapeutic aids should be cleaned between each patient with a neutral detergent. If toys or therapy items become contaminated with blood or body substances including saliva, by actions such as sneezing or putting into a child's mouth, remove from use until washed in warm water and detergent and leave to dry. Should it be required, dry cleaning instructions for the toy should be discussed with the patient and/or carer. If a toy cannot be cleaned it should be discarded.

Soft toys should not be permitted in a communal area unless the toy is being used as a therapeutic aid for an individual patient. Clinicians who use soft or otherwise 'difficult to clean' toys as therapeutic aids should consult with local infection prevention and control staff and undertake a documented infection prevention and control risk assessment for the selection, maintenance and cleaning of these items.

8.5 New technologies

New technologies have made great advancements with beneficial outcomes for patients requiring specialised and complex surgical procedures. In line with [Section 2.4.1](#), *Purchasing new equipment*, extensive consultation with the reprocessing unit and infection prevention and control is required prior to the purchase of any new technologies.

A risk assessment of the RMD may be required, particularly if the instrument is deemed to be 'difficult to clean'.

The assessment should consider:

- The design of the instrument
 - Can it be taken apart for thorough cleaning?
 - Are there any complex joints that cannot be cleaned adequately?
 - Will the design affect the ability to clean over time?
- Local capacity and expertise
 - Can optimal and validated reprocessing of this instrument be done in this unit?
 - Is this unit equipped to reprocess this instrument?
 - Do reprocessing staff need specific training to reprocess this instrument?

Risk assessment outcomes should be reported to the appropriate Clinical Governance delegate for further discussion with the PHO's product selection committee or equivalent.

[Section 2.4.1](#)
Purchasing new equipment

When new instrumentation is purchased, the PHO should ensure that the manufacturer or their representative provides initial training to PHO staff. Once initial training has been provided, local trainers are responsible for providing education to other staff members, including new staff.

8.6 Cleaning and reprocessing in community and home settings

Where possible, a PHO should provide HCWs with disposable sterile equipment as this will minimise the need to transport contaminated equipment and subsequent reprocessing. Disposable single-use equipment should be disposed of after use. Reusable equipment that can be reprocessed must be reprocessed in accordance with manufacturer's instructions.

Reprocessing for community settings should be consistent with the principles outlined in [Section 4.7, Patient equipment – Reprocessing](#), and this Section.

8.6.1 Portable materials and equipment

The following practices are recommended regarding cleaning and reprocessing of portable materials and equipment in community and home settings:

- A risk assessment for selection of portable items is to be undertaken by the HCW.
- Portable reusable materials and equipment e.g. equipment bags, weight scale, chair pads, examination mattresses, laptops or IV volumetric pump/pole, that are used in the provision of a service to patients are to be:
 - Able to be easily cleaned
 - Routinely cleaned at regular intervals in accordance with manufacturer's and/or health service recommendations
 - Cleaned after use and between patients
 - Removed from use if worn or damaged
- In non-clinical environments:
 - Do not take unnecessary equipment into the area, or
 - Use a protective sheet between the equipment and the surface
 - Clean and, if necessary, disinfect equipment on removal from the room
- Equipment provided to clients for use at home e.g. commodes, chairs, heel protectors, pressure relieving cushions, is to be:
 - Non-porous, fluid repellent and fully washable, or
 - Single patient use
- The PHO is to have a program for ensuring that loaned equipment is cleaned and, if necessary, disinfected when it is returned from clients' homes.

8.6.2 Transport of reusable medical devices

If transporting contaminated semi-critical or critical RMDs is necessary, the RMDs are to be confined and contained within a leak-proof plastic bag. Preferably, the bag should be disposable. The bag should then be placed in a rigid reusable container that is fixed within the car, and separated from the driver's compartment. The equipment and any non-disposable bag should be reprocessed. Contaminated equipment and unused sterile equipment should not be transported in the same container.

SECTION 9

RISK MITIGATION: SPECIALISED SETTINGS

ESTABLISH THE CONTEXT

IDENTIFY INFECTION RISKS

ASSESS THE RISK OF INFECTION

CONTROL THE RISK OF INFECTION

REVIEW EFFECTIVENESS OF CONTROL MEASURES

As a direct effect of their impaired immune defences, immunocompromised patients have an increased risk of infections and are at risk of incurring severe morbidity and mortality. This risk is compounded by the frequent requirement for indwelling vascular devices for the delivery of therapy e.g. dialysis and transfusion support, the high requirements for antibiotics, and frequent hospitalisations, which increase the potential for exposure to nosocomial pathogens. In addition, impaired immunity may lead to increased shedding of microorganisms, resulting in increased potential for disease transmission [163].

A PHO is to develop a risk mitigation strategy that includes the regular auditing and reporting of compliance with standard precautions, environmental cleaning, HAI surveillance outcomes and adherence to antimicrobial stewardship initiatives within the clinical areas, particularly where immunocompromised patients are accommodated. When compliance with standard precautions falls below acceptable quality levels, or nosocomial transmission of infection is confirmed, remedial action to address breaches in infection prevention and control should be implemented. A system for the early detection and screening of patients for risk factors and signs or symptoms of infection should be developed for the clinical services that manage immunocompromised patients. Screening for TB, hepatitis B and C and multi-drug resistant organisms may be particularly relevant for those undergoing intensive immunosuppressive regimens or high-risk procedures [164, 165].

[NSQHS Standard 3.3](#)

Developing and implementation systems and processes for reporting, investigating and analysing healthcare associated infections, and aligning these systems to the organisation's risk management strategy

[NSQHS Standard 3.3](#)

Implementing systems for using standard precautions and transmission-based precautions

[NSW Health PD2015_012](#)

Tuberculosis Management of People Knowingly Placing Others at Risk of Infection

Respiratory viruses and other pathogens circulating in the community may be introduced into healthcare facilities by visitors (particularly young children) and HCWs. Each PHO is to implement local policies for leave or deployment of unwell HCWs working in extreme risk areas, such as oncology, transplant units, NICUs and delivery suites, and for the exclusion of unwell visitors and young children from these clinical areas [166-169].

Annual influenza vaccination of HCWs, other clinical personnel, students, and contacts with those who are immunocompromised is strongly recommended to reduce the potential for influenza transmission in extreme risk areas.

[NSW Health PD2011_005](#)
Occupational Assessment,
Screening and Vaccination
Against Specified Infectious
Diseases

[NSW Health PD2014_029](#)
Leave Matters for the NSW
Health Service

See [NSW Health PD2012_061](#)
Environmental Cleaning
Policy for functional area
risk ratings

9.1.1 Neutropenia

For patients who are predicted to have prolonged and profound neutropenia, such as allogeneic stem cell transplant recipients, protective isolation should be considered to reduce potential exposure to HAIs and fungal spores, especially *Aspergillus*. Prohibiting plants, flowers or other organic debris may also further reduce environmental exposure to potentially pathogenic fungi [112, 169].

9.1.2 During construction

Construction activity can disturb fungal reservoirs, leading to aerosolisation of fungal spores throughout the healthcare facility. *A. fumigatus*, a common pathogenic fungal mould that produces airborne spores, is often in circulation during construction activities in hospital [170]. Fungal spores are resistant to drying, are able to remain suspended in the air for long periods and can travel substantial distances from the source of generation. Exposure to a low spore load can result in infection in immunocompromised individuals. Prior to any construction or maintenance activity, a PHO is to undertake a risk assessment and implement a risk management strategy to minimise the risk of infection in immunocompromised individuals.

[Australasian Health Facility Guidelines](#)
Part D Infection
Control

Patients who are at most risk of infection are those receiving bone marrow transplant, solid organ transplant, haematology, oncology and those receiving immunosuppressive medication. Additional measures may be required to minimise the risk of infection to these patient groups during construction e.g. air sampling.

9.2 Cystic fibrosis

Patients with cystic fibrosis (CF) are at risk of both acquiring and transmitting respiratory infections. Respiratory infection in patients with CF can be more significant than for other individuals and is associated with deterioration of lung function. Many different bacterial organisms, viruses and fungi can infect the respiratory tract of patients with CF. It is important that units that care for patients with CF (respiratory wards, non CF respiratory wards and hospitals without CF clinics) partner with local infection prevention and control units to implement the additional measures described in this section. Adherence to these measures should be monitored and fed back to the unit to enable continual improvement.

9.2.1 General precautions

When caring for any patient (inpatient or outpatient) with CF, HCWs are to employ:

- **Standard precautions**, particularly:
 - Hand hygiene before and after patient contact
 - Use of personal protective equipment i.e. gloves, gown and mask, for handling body substances/sputum, chest physiotherapy or if there is an increased risk of contamination to the HCW
 - Environmental cleaning
 - ⇒ Single rooms occupied by inpatients with CF must be terminally cleaned before their admission and after discharge.
 - ⇒ During inpatient admission, frequently touched surfaces should be cleaned routinely with a hospital grade disinfectant.
 - ⇒ All medical equipment used in CF clinics must be cleaned before entry and on removal.
 - Respiratory hygiene
 - ⇒ Patient (inpatient or outpatient) with CF to wear a face mask when ambulating around general hospital areas (anywhere except own bed area and gym with the physiotherapist)
 - ⇒ Prevent mixing of CF patients, regardless of their respiratory tract culture results, keeping patients $\geq 2\text{m}$ in all settings, to reduce the risk of droplet transmission of CF pathogens
 - ⇒ Cough etiquette should be encouraged among CF patients when attending any group activities.
- **Pulmonary function tests (PFT)** are to be performed in one of the following areas to reduce transmission from one person with CF to another person with CF:
 - In the exam room at the beginning of the clinic visit, allowing sufficient time to elapse between CF patients (times will depend on air changes per hour in the room and will vary within and between facilities);
 - In a negative pressure room (airborne infection isolation room);
 - In a PFT laboratory with high-efficiency particulate (HEPA) filters; or
 - In a PFT laboratory without HEPA filters, allowing 30 minutes to elapse between individuals with CF.

The need to employ additional infection prevention and control precautions when caring for a patient with CF is dependent on the presence or absence of certain risk criteria. Table 13 describes the risk criteria and outlines the additional precautions that should be employed, depending on the patient's risk level for inpatient and outpatient settings.

In addition, for outpatient settings (including oral health):

- Outpatients should not sit in the waiting area, but be shown straight into a consulting room. The room must be cleaned and left for a sufficient period of time before another patient with CF can enter the room (times will depend on air changes per hour in the room and will vary within and between facilities);
- Outpatients with CF should be advised not to wait in other communal areas, such as the pharmacy waiting area, in order to reduce risk of contact with other patients with CF. Where this is unavoidable the patient with CF should don a surgical mask.
- Patients known to have *B. cepacia* complex/*M. abscessus* colonisation should not attend routine CF clinics but be seen in other non-CF clinics.

Table 13. Levels of precautions for CF patients

Risk level	Risk criteria	Inpatient management	Outpatient management
1	<p>Any patient with a diagnosis of CF (suppurative lung disease) and:</p> <ul style="list-style-type: none"> No pathogens in their sputum No detection of any bacteria listed in Level 2 risk criteria 	<ul style="list-style-type: none"> Standard precautions Where possible, patient should be managed in ensuite single rooms. Otherwise, CF patients should not share a room with other CF patients or patients with respiratory illness.* 	<ul style="list-style-type: none"> Own room in CF outpatient clinic Room to be cleaned by staff prior to next patient
2	<p>Any patient with a diagnosis of CF (suppurative lung disease) and:</p> <ul style="list-style-type: none"> MRSA Non-tuberculous mycobacteria ESBL isolates VRE <i>Acinetobacter baumannii</i> Mucoid or non mucoid pseudomonas RESISTANT to aminoglycosides and beta lactams 	<ul style="list-style-type: none"> Standard, contact (for MRSA, VRE, etc.) and droplet precautions Isolate in single room with ensuite.* 	<ul style="list-style-type: none"> Droplet precautions (in addition to standard and contact precautions) Own room with door closed Room to be cleaned and disinfected by cleaning services after use HCWs to wear gowns and gloves during consult Lung function equipment cleaned after use
3	<p>Any patient with a diagnosis of CF (suppurative lung disease) and:</p> <ul style="list-style-type: none"> <i>Burkholderia cepacia</i> complex <i>Mycobacterium abscessus</i> Other (unusual resistant organisms) 	<ul style="list-style-type: none"> Standard, contact and droplet precautions Isolate in single room with ensuite* Patients known to have <i>B. cepacia</i> complex/<i>M. abscessus</i> should be admitted to a single room with an ensuite on a different ward to other patients with CF. If two or more patients with <i>B. cepacia</i> complex /<i>M. abscessus</i> are admitted they must be accommodated in single rooms on separate medical wards. In facilities with paediatric units where patients can only be accommodated in the paediatric ward, patients with <i>B. cepacia</i> complex should not be cared for by the same nursing staff as those caring for patients with <i>M. abscessus</i> 	<ul style="list-style-type: none"> Droplet precautions (in addition to standard and contact precautions) Own room with door closed Room to be cleaned and disinfected by cleaning services after use HCWs to wear gowns and gloves during consult Lung function equipment cleaned after use

* Familial cohorting is permitted, as the risk of transmission is comparable to the home environment

HCWs should apply additional precautions with discretion. HCWs should ensure that the patient and their family/carer are provided with information on why any additional precautions are required and any actions that the patient or their family/carer are required to undertake.

9.2.2 Clearance

Patients with CF do not fit the [normal MRO clearance recommendations](#). Clearance for patients with CF will need to be determined on a case-by-case basis by the patient's clinical team, with consideration being given to aetiology, epidemiology and other key clinical factors.

9.3 Haemodialysis

Haemodialysis has been associated with transmission of MROs. The routine management of these MROs has been addressed throughout this manual and haemodialysis is like any extreme risk area. This section specifically addresses the high risk concern of blood borne viruses (BBV) in haemodialysis. BBV infection may occur from contamination during the haemodialysis procedure (e.g. during venous access) or via the dialysis system (e.g. extra-corporeal circuit), from breaks in established procedures, due to lack of monitoring for contaminants, due to reprocessing failures or inadequately trained/educated staff [171, 172]. Although outbreaks of HCV have been reported in haemodialysis patients, the efficiency of transmission appears low. The risk of bloodborne infection in the haemodialysis setting may be reduced by:

- adherence to standard precautions, including routine cleaning and reprocessing of patient equipment;
- adherence to procedures for disinfection and maintenance of equipment according to manufacturer's instructions;
- a patient education program that includes teaching patients, their visitors and families on their role in the prevention of infections;
- routine monitoring and follow up of patients undergoing haemodialysis in relation to bloodborne viral status;
- hepatitis B vaccination for all susceptible haemodialysis patients and HCWs;
- redeploying HCWs who have increased susceptibility to hepatitis B, medically assessed on case-by-case basis.

[NSQHS Standard 3.6](#)

Developing, implementing and monitoring a risk-based workforce immunisation program in accordance with the current NHMRC Australian immunisation guidelines

[NSQHS Standard 3.19](#)

Ensuring consumer-specific information on the management and reduction of healthcare associated infections is available at the point of care

[NSW Health PD2017_010](#)

HIV, Hepatitis B and Hepatitis C - Management of Healthcare Workers Potentially Exposed

Patients that are HBsAg positive should be treated in a separate room (or another area away from seronegative patients, if room is not available) with dedicated equipment and, where possible, nursing staff [173].

A dedicated room can be reused for other patients after it has been cleaned and disinfected. The dedicated equipment can be reused for seronegative patients after being cleaned and disinfected.

There is insufficient evidence to justify the routine isolation of dialysis patients positive for HCV or HIV [174]. Isolation should be considered if high prevalence (>30%) of HCV is observed [175].

9.4 Tuberculosis

The NSW Tuberculosis (TB) program is the provider of specialised services for the prevention and control of TB in NSW. In the event of a case of TB in a patient, HCW or visitor, the TB coordinator in the local health district/network should be notified. The TB coordinator, in conjunction with the TB Program, will work with the PHO to identify contacts, prepare a management plan and arrange screening and follow-up for patients, HCWs and others as required.

Patients with TB are to be cared for according to relevant NSW Health policies and guidelines, available at:

<http://www.health.nsw.gov.au/Infectious/tuberculosis/Pages/Policies.aspx>.

9.4.1 Transplant screening for tuberculosis

All patients on the active transplant list for solid organ transplantation and bone marrow transplant must be assessed for their risk of previous exposure to TB and should be screened as part of the transplant workup. This can be by tuberculin skin test or blood test, if immunocompromised, as per local protocol.

[NSW TB Program](#)

[NSW Health PD2015_012](#)

Tuberculosis Management of People Knowingly Placing Others at Risk of Infection

[NSW Health PD2014_050](#)

Principles for the Management of Tuberculosis in NSW

[NSW Health PD2008_017](#)

Tuberculosis Contact Tracing

9.5 Interventional radiology settings

Interventional radiology (IR) involves minimally invasive, diagnostic and interventional procedures, performed under image guidance including digital subtraction angiography computed tomography, ultrasound and magnetic resonance imaging. Often these procedures are undertaken in procedure rooms rather than in operating rooms. Procedures include percutaneous access via a small skin incision. This incision presents a portal of entry into the body for microorganisms and may promote the acquisition of a HAI, particularly surgical site or central line infections.

9.5.1 IR worklists

When developing IR worklists:

- Always prioritise clinical need and urgency over disease status.
- Where flexibility is possible, arrange the IR work list so that clean and clean-contaminated procedures are performed prior to contaminated and dirty procedures [176]

9.5.2 IR equipment

See [Section 8](#), *Risk mitigation: Reprocessing* for general principles and advice on single-use and reprocessed equipment.

Many procedures are performed under ultrasound guidance, including the insertion of central venous access devices. While mainly surface probes are used, it is possible that intra-cavity probes may be used (e.g. during transrectal prostate biopsies). Disposable sterile probe sleeves should be applied and these should be disposed of in accordance with [Section 4.9.6](#), *Waste disposal*. Regardless of the use of probe sleeves, the probes must be reprocessed appropriately between patient use (see [Section 8.3.1](#), *Intracavity ultrasounds*).

[NSW Health PD2011_060](#)

Central Venous Access Device Insertion and Post Insertion Care

[NSW Health PD2012_061](#)

Environmental Cleaning Policy

[Environmental Cleaning SOP](#)

9.5.3 IR environment

Installation of positive pressure air change ventilation should be considered when planning new IR facilities (see [Section 2.4.1](#), *Purchasing new equipment*).

IR procedures, particularly clean IR procedures, should be performed under positive pressure air change ventilation. If this is not available, the doors to the procedural room should remain closed. Traffic into and around the room should also be restricted.

The IR setting is a high risk rated functional area, therefore environmental cleaning is important in the prevention of cross infection (See [Section 4.6](#), *Environmental Cleaning*). Cleaning in IR settings should be in line with the NSW Health *Environmental Cleaning Policy* ([PD2012_061](#)) for high risk functional areas. Particular attention should be made to the cleaning of arm boards and ceiling mounted equipment.

[NSW Health PD2012_061](#)
Environmental Cleaning Policy

[Environmental Cleaning SOP](#)

9.5.4 Aseptic technique in IR

To ensure that aseptic technique is used in IR:

- Thorough skin preparation should be performed on clean skin using an appropriate antiseptic (i.e. >0.5% chlorhexidine gluconate with 70% alcohol). If there is a contraindication to chlorhexidine, a suitable alternative should be used (e.g. povidone-iodine).
- If hair removal is required, hair should be clipped rather than shaved.
- Appropriate attire should be worn including caps, masks, sterile gown, and sterile gloves (see [Section 4.11.3](#), *Staff attire*).
- Sterile drapes are to be used to create a barrier between the surgical field and potential sources of microorganisms.
- Maintain asepsis of key sites and key parts of catheters, prostheses and implantable devices.

9.5.5 Exposure to blood and body substances in IR

HCWs working in IR are at risk of being exposed to blood and/or body substances. To minimise this risk, HCWs are to adhere to Standard Precautions, including safe handling of sharps, specimens and waste.

9.6 Respiratory and sleep settings

9.6.1 Nebulisers

There is some evidence that suggests nebulisation, combined with disease symptomatology such as coughing, may have been a risk for the aerosolised spread of certain transmissible diseases [177, 178]. Therefore, to minimise the likelihood of the aerosolised transmission, it is recommended that effective alternatives, such as metered dose inhaler with spacer, are used where possible [179].

Where it is not feasible to use a metered dose inhaler and spacer, a nebuliser can be used in a designated room or area where other patients and visitors have limited access. HCWs attending to a patient using a nebuliser should wear a P2/N95 mask.

9.6.2 Use of filters on respiratory devices

Where available, single-use respiratory equipment should be used. Single-use respiratory equipment designed for use on one person only does not require a filter. If single use equipment is not available, a filter is to be used for blow-and-inhale procedures. The use of filters does not interfere with the quality of the recordings. Certain types of equipment, such as older types of spirometers which have positive pressure when in use, require a filter.

9.6.3 Resuscitation devices

HCWs should use resuscitation devices, such as masks, during cardiopulmonary resuscitation (CPR) to prevent direct contact between the mouth of the resuscitator and the person being resuscitated [180]. A PHO should ensure that individual resuscitation devices are available and accessible in all patient areas. Where possible, single use resuscitation devices should be used. CPR training provided or approved by the PHO should include instruction on the use of resuscitation devices.

[NSQHS Standard 3.16](#)

Reprocessing reusable medical equipment, instruments and devices in accordance with relevant national or international standards and manufacturers' instructions

Semi-critical resuscitation devices

Semi-critical equipment used for clinical procedures in the sleep and/or respiratory investigation labs are to be cleaned and disinfected or sterilized between each patient use to prevent and minimise the occurrence or transmission of infection.

9.7 Maternity settings

9.7.1 Prevention of vertical transmission

Facilities should have in place a referral process for mothers with BBVs to ensure they are referred to appropriate clinical services ante nataly.

A neonate has an increased potential of vertical transmission of infectious diseases when its skin integrity has been breached *in utero*. To minimise this risk avoid the following medical procedures if possible:

- fetal scalp electrode monitoring and fetal blood sampling on babies of mothers who are HIV positive or HCV PCR RNA positive or HBsAg or HBeAg positive. It may be performed on HCV PCR RNA negative mothers.
- fetal scalp electrode monitoring and fetal blood sampling on babies of mothers who are HSV active or Group B Streptococcus positive who have not been given appropriate antibiotics 30 minutes prior to the procedure.

9.7.2 Prevention of bloodborne virus exposure

After birth, initial skin-to-skin contact and the first breastfeed are important and are a priority. This should occur prior to cleansing the baby of blood and body substances [181]. Blood and other body substances must be removed from the baby's skin and eyes as soon as practicable. Gloves should be worn by all HCWs, visitors and family (except the mother) when handling the baby until the baby has been bathed [181].

Additional considerations are needed when cleaning baths used in birthing suites. Equipment such as a long handled sponge mop may facilitate cleaning. If reusing the bath plug, ensure the plug and any attachment can be cleaned. The following cleaning procedure is recommended for baths to address risks associated with exposure to blood and body substances:

[NSW Health PD2014_004](#)

Incident Management

[Australasian Health Facility Guidelines](#)

Part D Infection Control
(Bath and Showers)

[Environmental Cleaning SOP](#)

1. Empty water out of the bath. Plugs are required to be attached to a chain for easy removal
2. Rinse bath with water
3. Clean bath using long handled sponge mop with a hospital grade neutral detergent and disinfectant
4. Allow 10 minute contact time before rinsing bath with water

Module 3 Hand basin/bath cleaning

9.8 Mental health, drug and alcohol settings

The primary focus of patient care in mental health, drug or alcohol (MHDA) settings is treatment for MHDA issues. The physical health status of patients is comparable to their community peer group. The infection prevention and control program is adapted to account for the patient's physical health status and mental acuity, the focus of treatment and the facilities/layout of the unit. Infection control equipment, such as trolleys for PPE and brackets for alcohol-based hand rub, that is left in areas accessible to patients needs to be carefully reviewed for safety e.g. ligature risk.

PHOs and HCWs providing care in this setting should:

- identify potential infection risks, and develop safe work practices to mitigate these risks
- encourage patients to perform hand hygiene by facilitating hand hygiene education and providing patients and HCWs with safe access to hand hygiene facilities
- encourage and facilitate patients to maintain their personal hygiene

Where outpatient, sexual health, community or in-home care, are also provided, please refer to [Section 9.10](#), *Ambulatory care settings*, and [Section 9.13](#), *Community and home settings*, for service-specific guidance.

9.9 Residential, rehabilitation and long term care settings

Infectious diseases have the potential to spread readily in residential, rehabilitation and long term care settings, as residents live in close proximity, typically with communal facilities e.g. dining rooms and lounges.

[NHMRC](#)
Infection prevention and control in residential and community aged care

Residents may be susceptible to infection because of health conditions that impair immunity. Common clinical risks include the prevalence of MROs, the incidence of diarrhoea in patients and prevalence of wounds.

In residential, rehabilitation and long term care settings, the infection control program is adapted according to the patient's physical health status, mental acuity, requirement for a home-like environment and the facilities/layout of the premises.

In the aged care context, the infection control program must also address the [Australian Aged Care Quality Agency](#) Accreditation Standards (Standard 4.7).

[Quality of Care Principles 2014](#)
Part 1
[Australian Aged Care Quality Agency](#)
Tools

Services may be available to assist and support keeping patients within a residential, rehabilitation or long term care facility when there is an infectious disease outbreak to reduce the need to transfer patients to acute hospital facilities. In consultation with the relevant PHU and NSW Ambulance local management, it may be appropriate to request Extended Care Paramedics or Specialist Paramedics to assist in managing aspects of an infectious disease outbreak (e.g. patient assessment, rehydration and ongoing monitoring on site) in these settings (see [Section 9.9.1](#),

Using extended paramedic services in residential and long term care facilities). Similar services may be available within some NSW LHDs/SHNs.

9.9.1 Using extended paramedic services in residential and long term care facilities

In consultation with the relevant PHU and NSW Ambulance local management, it may be appropriate to request Extended Care Paramedics or Specialist Paramedics to assist in managing an outbreak of an infectious disease within residential or long term care facilities. This has the potential to provide definitive care (e.g. patient assessment, rehydration and ongoing monitoring as needed) on site and avoid or reduce the need to transfer patients to other health care facilities.

9.10 Ambulatory care settings

Each PHO may be responsible for a diverse array of speciality ambulatory care clinics and services.

Ambulatory care settings that involve unique infection prevention and control risks include:

- Renal outpatient clinics
- Oncology and cancer care outpatient units
- Bone marrow transplant clinics
- Outpatient units that perform medical procedures
- CF clinics (see [Section 9.2](#), *Cystic fibrosis*).

[Centers for Disease Control and Prevention](#)
Basic Infection Control and Prevention Plan for Outpatient Oncology Settings

Each setting requires:

- A risk management plan in place that identifies potential infection risks for outpatient settings, including an environmental assessment, and details appropriate strategies to mitigate these risks. This may include developing strategies to enable early detection of patients with infectious diseases prior to attendance at an outpatient clinic or at entry points of a facility and employing patient placement procedures for presenting patients who require isolation or designated toilet facilities.
- Resources to implement the risk management plan to be employed.
- HCWs to observe other infection prevention and control principles, such as antimicrobial stewardship and occupational vaccination.
- An assessment of the requirement for transmission-based precautions dependent on the patient populations treated and procedures performed.
- Promotion of hand hygiene, respiratory hygiene and cough etiquette to patients and their companions and the provision of resources e.g. alcohol-based hand rub, tissues and rubbish bins.

[Centers for Disease Control and Prevention](#)
Guide to Infection Prevention for Outpatient Settings: Minimum Expectations for Safe Care

[Centers for Disease Control and Prevention](#)
Infection Prevention Checklist for Outpatient Settings: Minimum Expectations for Safe Care

Infections are an important cause of morbidity and mortality in many of the patients that frequent these clinics and units, particularly those that are immunocompromised, thus infection prevention is a key patient safety priority.

During pregnancy, the clinical consequences of acquiring an infection may be more severe. Therefore, any outpatient settings where pregnant women are likely to attend should identify

potential infection risks to pregnant women and ensure that these risks are minimised or eliminated as much as practically possible.

9.11 Oral health settings

HCWs working in oral health care settings are at risk of being exposed to high concentrations of aerosols and splatter during dental procedures and may be at risk of infection transmission. Oral health care must be delivered in a manner consistent with the NSW Health *Oral Health: Cleaning, Disinfecting and Sterilizing Policy Directive* ([PD2013_024](#)) and the NSW Health *Oral Health: Post-Operative Care for Dental Extractions Policy Directive* ([PD2013_026](#)) and current NSW Health infection control policies.

[Section 4.3.3](#)

Aseptic technique in oral health settings

[Section 4.2.3](#)

Gowns and aprons

[Section 5.5](#)

Transmission-based precautions in oral health

[Section 8.2.2](#)

Oral health (reprocessing)

9.12 Ophthalmic and optometry settings

The cornea and conjunctiva are classified as semi-critical sites and are highly susceptible to infection. Contact lenses are not to be shared. Diagnostic contact lenses should be reprocessed in accordance with the manufacturer's instructions. Single use or disposable ophthalmic equipment should be used if adequate cleaning or reprocessing cannot be achieved. Products used for cleaning and disinfecting ophthalmic equipment that is used on the external eye must not be harmful to the eye. After cleaning or reprocessing, the equipment must be rinsed thoroughly and dried to ensure no chemical residue is present to prevent eye damage.

[NSQHS Standard 3.16](#)

Reprocessing reusable medical equipment, instruments and devices in accordance with relevant national or international standards and manufacturers' instructions

9.13 Community and home settings

A PHO may provide care to patients in a range of settings outside hospitals, including private homes and community health centres. The PHO responsible for providing these services is to ensure that appropriate infection prevention and control resources, such as hand hygiene products, disposable paper towels, equipment cleaning solutions or wipes, PPE and sharps containers, are available to HCWs working in these settings. The PHO and its HCWs should also ensure that the risk of infection transmission within the community is minimised.

At the minimum HCWs working in these settings are to adhere to standard precautions ([Section 4, Risk mitigation: Standard precautions](#)) and transmission-based precautions ([Section 5, Risk mitigation: Transmission-based precautions](#)). HCWs working in home and community settings may experience difficulties in accessing facilities and resources typically found in a hospital. Due to these constraints, the PHO should apply a risk assessment approach to identify potential infection risks for its specific community settings and develop safe work practices to mitigate these risks.

[Section 4.1.8](#)

Hand hygiene in community and home settings

[Section 4.4.2](#)

Sharps in community and home settings

[Section 4.9.7](#)

Waste disposal in community health settings

[Section 7.4.2](#)

Precautions for community health settings (MROs)

[Section 8.6](#)

Cleaning and reprocessing in community and home settings

9.14 Ambulance and patient transport settings

The transfer and transport of patients within and between PHOs should always be guided by clinical need and urgency, not by their infection status. All agencies involved in patient transfer and transport are to, at the

[NSQHS Standard 3.12](#)

Developing and implementing protocols relating to the admission,

minimum, exercise standard precautions during the transfer and transport of any patient. This includes ensuring that the transport vehicle and equipment is cleaned between each patient.

The PHO booking the transfer or transport should notify all agencies involved in the transfer or transport of any patient with an identified infection risk prior to the transfer or transport of the patient. The PHO booking the transfer should ensure the patient performs appropriate personal hygiene prior to transfer or transport, where possible. This may include hand hygiene, showering and use of clean clothing prior to transfer or transport.

It is the responsibility of the transfer or transporting agency to ensure transfer and transport staff have undertaken appropriate training and education to enable them to employ the appropriate transmission-based precautions as per [Section 5](#), *Risk mitigation: transmission-based precautions*, in addition to standard precautions, during transfer or transport. A recommended framework for training is outlined in the national unit of competency *HLTINF001 - Comply with infection prevention and control policies and procedures*.

receipt and transfer of patients with an infection

See [Section 7.4.3](#), *Transferring or transporting a patient with a MRO*, for advice on transferring or transporting patients with a MRO

training.gov.au
[HLTINF001](#)
Comply with infection prevention and control policies and procedures

9.15 Mortuary and care of the deceased

9.15.1 Post-mortem care

When handling the bodies of deceased persons, or when undertaking a post-mortem examination, standard precautions are required at all times.

Depending on the known or suspected infection status of the body, transmission-based precautions may also be required and should be maintained until the body has been completely enclosed for transport. If transmission-based precautions were required prior to death, these precautions must be continued when handling the deceased. Procedures for handling bodies of the deceased, the use of body bags and removal of bodies from body bags are outlined in the NSW [Public Health Regulation 2012 \(Extract ss49-93\): Part 8 Disposal of bodies](#).

[NSQHS Standard 3.11](#)
Implementing systems for using standard precautions and transmission-based precautions

[NSW Health PD2010_054](#)
Coroners Cases and the Coroner's Act 2009

[NHMRC](#)
Australian Guidelines for the Prevention and Control of Infection in Healthcare
Part B: Standard and Transmission-Based Precautions

[Public Health Act 2010](#)

[Public Health Regulation 2012](#)
Part 8, Disposal of Bodies

According to the *Public Health Regulation 2012*:

- (1) A person must, when carrying out any procedure on a body, comply with the guidelines specified in Part B of the [Australian Guidelines for the Prevention and Control of Infection in Healthcare](#) published by the National Health and Medical Research Council
- (2) A person must, when placing a body in a bag or wrapping a body, comply with the document entitled Infection Control Policy published by the Ministry of Health.

Prescribed infectious diseases

Additional handling and labelling requirements apply to the bodies of deceased persons with *prescribed infectious diseases*. These are outlined in the *Public Health Regulation 2012*.

Prescribed infectious diseases means any of the following diseases:

- | | |
|---------------------------------------|---|
| (a) avian influenza in humans | (f) smallpox |
| (b) diphtheria | (g) tuberculosis |
| (c) plague | (h) any viral haemorrhagic fever (including Lassa, Marburg, Ebola and Crimean-Congo fevers) |
| (d) respiratory anthrax | |
| (e) Severe Acute Respiratory Syndrome | |

In accordance with the Public Health Regulation 2012, section 57: If the person responsible for removing the body of the deceased has reason to believe that the body is infected with a prescribed infectious disease, the bag or wrapping is to be clearly and indelibly marked with the words "PRESCRIBED INFECTIOUS DISEASE - HANDLE WITH CARE".

9.15.2 Post-mortem examination

Practices used for post-mortem examinations are to minimise the risk of exposure of HCWs to infectious diseases and minimise the risk of infection being passed from the autopsy room to other areas in the healthcare facility. Standard precautions are required at all times and, depending on the known or suspected infection status of the body, transmission-based precautions may also be required.

Precautions may also include adopting engineering controls and changed work practices. For example:

- work surfaces contaminated during post-mortem procedures should be cleaned with a neutral detergent or degreaser solution;
- instruments and equipment used in post-mortem procedures must be reprocessed as described in [Section 8, Risk mitigation: Reprocessing](#);
- instruments and equipment used on cases of Creutzfeldt-Jakob disease should be handled in accordance with national guidelines for infection prevention and control [182];
- engineering controls such as ventilation and safety devices for autopsy equipment should be in place;
- sharps injuries may be minimised by using the minimal number of sharp instruments, using cut-resistant gloves and blunt dissection tools and techniques [183]; and
- employing airborne precautions when performing aerosolising procedures during post-mortem.

9.16 Cryotherapy

Care should be taken to ensure that liquid nitrogen canisters do not become contaminated during cryotherapy procedures. Evidence indicates that if contamination occurs, viruses and bacteria may be able to survive immersion in liquid nitrogen [184]. Where the practice of decanting liquid nitrogen is used for routine removal of warts, sufficient liquid nitrogen should be decanted into a new disposable cup or dish, or one that can be sterilised after each patient use. A disposable cotton-tipped applicator should be used for each application.

The residual and disposable cup or disk should be discarded after each patient use. Similar precautions should be taken with carbon dioxide and other cryotherapy systems used in the treatment of skin conditions.

9.17 Animals

9.17.1 Pets

The NSW Health *Animal Visits and Interventions in Public and Private Health Services in NSW* Guideline ([GL2012_007](#)) outlines the appropriate measures to be taken in implementing a program of animal assisted intervention in NSW. A PHO that is implementing a program of animal assisted intervention should consider their responsibilities under the Companion Animal Act 1998 and Companion Animal Regulations. The risk of zoonotic transmission to patients and HCWs should be considered when pets are present within a PHO.

[NSW Health GL2012_007](#)
Animal Visits and Interventions in Public and Private Health Services in NSW

[Companion Animals Act 1998](#)

[Companion Animals Regulation 2008](#)

9.17.2 Animals as patients

The risk for zoonotic transmission should be considered when animals are present within a PHO. In particular, the risk of cross-contamination between animal and human is to be assessed when the facilities of a PHO are being used for the clinical treatment of an animal. For those PHOs who provide or are considering providing this service, a risk assessment should be undertaken that considers:

- whether the room/area used for animal care can be made safe for human patients after animal treatment; and
- which disinfecting or sterilizing procedures need to be done to ensure the safety of human patients.

[NSW PD 2017_013](#)
Infection Prevention and Control Policy

SECTION 10

SURVEILLANCE, AUDITING AND NOTIFICATION

ESTABLISH THE CONTEXT

IDENTIFY INFECTION RISKS

ASSESS THE RISK OF INFECTION

CONTROL THE RISK OF INFECTION

REVIEW EFFECTIVENESS OF CONTROL MEASURES

10.1 Role of surveillance

Surveillance is an essential component of any infection prevention and control program. Surveillance involves the systematic collection, collation, analysis, interpretation and dissemination of data for use in the planning, implementation and evaluation of the provision of healthcare as well as quality and safety of patient care [185, 186]. The primary purpose of surveillance in infection prevention and control is to monitor for sentinel events, control charts and microbiological trends and report these to the Infection Prevention and Control Service. Significant critical issues should be escalated to the health service or LHD management as soon as possible to determine ongoing action.

In NSW, a number of mandatory HAI clinical indicators have been established for statewide HAI surveillance purposes. When the PHO submits data on any clinical indicators a suitably qualified or experienced HCW, who is able to reliably interpret, evaluate and report recommendations to a peak committee, is needed. In addition to mandatory indicators, other clinical indicators may be used locally. When establishing additional clinical indicators consider:

- Prevalence - *has there been a sudden increase in cases?*
- Setting - *will all departments be surveyed or only specific ones?*
- Capacity to undertake surveillance - *is there staff and systems available to undertake this surveillance?*
- Availability of data - *is there sufficient data available to support this?*

[Australian Guidelines for the Prevention and Control of Infection in Healthcare](#) -

Section C4
(NHMRC 2010)

ACSQHC
[National definition and calculation of HAI](#)
[Staphylococcus aureus bacteraemia](#)

[CDI Surveillance Implementation Guide](#)

[National definition and](#)

- Potential for change - *is there potential for an intervention to be introduced and supported locally to improve HAI rates?*
- Relevance to the risk - *does the risk warrant measuring and reporting the indicator?*
- Feedback and reporting lines - *who is this new information going to be reported to?*

[calculation of Hospital identified *Clostridium difficile* infection](#)

[National definition and calculation of central line Associated Blood Stream Infection](#)

[Surveillance Validation Guide for healthcare associated *Staphylococcus aureus* bloodstream infection](#)

[SAB Surveillance Implementation Guide](#)

[Implementation Guide for Surveillance of Central Line Associated Bloodstream Infection](#)

[NSW Health HAI Clinical Indicator Manual](#)

When conducting HAI surveillance:

- use standardised definitions where available and appropriate
- use a standardised data collection tool where available and appropriate
- undertake regular data collection in line with reporting requirements
- establish baseline rates and continue surveillance over time (or as long as required if a local indicator).

It is imperative to only collect data that is useful and directly related to the prevention and control of HAI. If there is no useful outcome for data collection (i.e. intervention is not possible, and/or improvement cannot be achieved) then surveillance objectives should be re-assessed.

10.1.1 Mandatory HAI surveillance in NSW

The NSW HAI Clinical Indicator Manual outlines the minimum level of mandatory HAI surveillance that all NSW PHOs are to undertake. These are outlined in Table 14.

Table 14. NSW HAI clinical indicators

Clinical Indicator	Rationale
MRSA acquired in ICUs	Patients in ICU are at a high risk of acquiring MRSA, and surveillance looks at acquisition through either colonisation or infection.
CLABSI	Patients in ICU are at high risk of HAI through invasive central line insertion (centrally and peripherally) and post insertion management.
<i>Staphylococcus aureus</i> bacteraemia (SAB)	SAB infections are associated with increased patient morbidity and mortality and are seen as potentially preventable.
Surgical site infections (SSIs) (hip & knee arthroplasties, coronary artery bypass grafts)	SSI account for around 70% of all HAIs in hospitalised patients [187].
<i>Clostridium difficile</i> infection.	CDI has been identified as the most common cause of antibiotic associated diarrhoea in hospitalised patients. HAIs involving CDI are considered indicators of poor antimicrobial stewardship.

The Clinical Excellence Commission intends to add the following indicators in 2016:

- *Vancomycin resistant enterococci bacteraemia* - Bloodstream infections caused by VRE have been associated with significant mortality for critically ill and immunocompromised patients.
- *CPE bacteraemia* - Much higher mortality rates have been attributed to patients with CPE bacteraemia than non-resistant strains of similar infections.
- CPE colonisation and infection rates

PHOs should have systems in place to ensure staff whose role it is to conduct mandatory surveillance can receive all reports, documents and results that are necessary to conduct HAI surveillance. This would include microbiology reports, access to medical records systems, and theatre management systems.

10.1.2 Suggested surveillance in non-acute settings

The incidence of HAIs in non-acute settings should be regularly monitored. The type and scope of surveillance will be determined by the type of service being provided and the associated risk to the patient.

[The Australian Council on Healthcare Standards](#)

Clinical Indicator manuals for oral health and hospital in the home (Password required)

Surveillance activities for community-based settings could include but are not limited to:

- Oral health clinics:
 - Infections identified following dental treatment. This can be recorded as a HAI register or through data entry record of an antibiotic script following a procedure
- Community-based settings
 - Unplanned readmissions to hospital due to an infection related complication
 - Infection rates associated with peripherally inserted intravenous cannulas, the management of central venous access devices and urinary catheterisation.

Collection and reporting of occupational exposures to blood and/or body fluids are mandatory for all public facilities, including:

- Community Acute without surgery;
- Community Non-Acute;
- Nursing Homes;
- Multi-Purpose Services; and
- Hospices.

[NSW Health PD2017_013](#)

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Monitoring should be specific to a significant organism, condition or process where HAIs pose an increased risk. Surveillance should be evidence-based, utilise clear definitions and, where possible, allow for benchmarking between similar PHOs. Adaptations of standardised clinical indicators or locally developed clinical indicators should be reviewed by a suitably qualified HCW with experience in data collection and analysis prior to implementation.

10.1.3 Antimicrobial resistance surveillance methods

To meet the NSQHS Standards, a PHO must monitor antimicrobial usage and resistance. A suggested means of monitoring antimicrobial resistance is through the development of an annual hospital-level cumulative antibiogram, which will provide information on likely antimicrobial susceptibilities for common microorganisms.

This information can be used to guide empiric antibiotic therapy. The ACSQHC has published a *Specification for a Hospital Cumulative*

[NSQHS Standards Action 3.14.3](#)

Monitoring of antimicrobial usage and resistance is undertaken

Antibiogram which provides more information on the use of hospital cumulative antibiograms.

ACSQHC, 2013
[Specification for Hospital Cumulative Antibiograms](#)

For smaller PHOs where a hospital-level cumulative antibiogram may not be feasible or appropriate, antimicrobial resistance may be monitored through review of MRO data in liaison with the microbiology service provider and the committee that oversees antimicrobial stewardship in the PHO, with a specific focus on how local antimicrobial susceptibility patterns may impact empiric antibiotic therapy.

In community health settings, antimicrobial resistance may be monitored by reviewing infection rates associated with insertion of medical devices, checking whether these infections are due to MROs, and conducting targeted surveillance, where appropriate, for microorganisms, including MROs.

[Guide to the NSQHS Standards for community health services](#)

At the time of writing, dental services were not required to monitor antimicrobial resistance. However, in keeping with antimicrobial stewardship principles, any information available on antimicrobial resistance in the patient population being treated could be used to ensure appropriate antibiotics were recommended and prescribed in the service.

[NSQHS Standards Guide for Dental Practices and Services](#)

Monitoring antimicrobial resistance aligns with the Australian Government's National Antimicrobial Resistance Strategy (2015) which provides a framework to guide actions on preventing the development and spread of antimicrobial resistance.

[National Antimicrobial Resistance Strategy \(2015-2019\)](#)

10.2 Auditing

10.2.1 Auditing principles

In the context of infection control, auditing is a process aimed at reducing clinical variation with specific infection prevention or control strategies, to maintain patient safety. Using a systematic and objective approach to assess the effectiveness of and/or compliance with specific infection prevention or control strategy, an audit may be conducted to yield quantitative or qualitative data, or both [188].

An infection control audit should focus on a specific topic, be repeatable and preferably involve the use of a standardised tool if benchmarking is required [189]. Audits therefore should be brief and easy for the auditor to complete and understand. Following the audit, an action plan should be formulated to address any areas which do not meet the required practice. The action plan should be shared with the overseeing Infection Prevention and Control Committee (or equivalent representative) and direct line management.

Auditing in infection control can be used to identify specific practices and behaviours against standards or policies, with the purpose of marking compliance or areas for improvement. Auditing can be done at the point-of-care, through the review of healthcare records, or both.

[NSQHS Standard 3.4](#)
Undertaking quality improvement activities to reduce healthcare associated infections through changes to practice

Examples of point-of-care audit could be to measure compliance with policies or procedures for:

- post-insertion peripheral cannula management;
- aseptic technique;
- standard or transmission-based precautions; or
- fingernail and/or hand/wrist jewellery of the HCW.

[Australian Guidelines for the Prevention and Control of Infection in Healthcare - Section C4](#)
(NHMRC 2010)

Examples of audits that involve a review of healthcare records may include:

- correct documentation for insertion or removal of peripheral cannula;
- properly documented central line insertion or removal (and/or proceduralist identification);
- screening swabs on admission (e.g. MRO, wound swabs); or
- HCW uptake of immunisation.

HAI auditing identifies areas for improvement and areas of exemplary practice in relation to quality and safety. In addition, an audit provides a level of assurance around the compliance with standards and policy requirements developed by NSW Ministry of Health and supported by the NSQHS Standards (specifically Standard 3). An audit should complement a range of infection control activities which aim to improve or provide assurance on the safety and quality of patient care.

Case study 9: Poppy's story - Auditing for change

In the surgical ward where Poppy, an RN, works there has been feedback from the Nurse Unit Manager (NUM) about a recent incident concerning a patient's infected cannula site. A look through the patient's progress notes established that the likely contributing factor for the infection was because the cannula had been left in situ for 6 days. Looking to improve patient safety in her ward, the NUM asks Poppy to conduct an audit of staff adherence to the *Peripheral Intravenous Cannula (PIVC) Insertion and Post Insertion Care in Adult Patients* guideline.

After consultation with the IPC, Poppy is given an audit tool that specifically refers to cannula management based on guidelines from the NSW Ministry of Health. The audit is brief, easy to follow and can be completed by any clinical staff with the relevant experience.

Poppy completes the audit and now has data from 16 patients with PIVC from her ward.

She notes that generally PIVC are managed as per the guidelines however she discovers that one patient has a cannula site with phlebitis and another two have no documentation surrounding insertion whatsoever. Poppy reports this information back to her NUM who immediately schedules a ward meeting to share this information with all her staff. The meeting is intended to improve staff compliance with PIVC management guidelines, therefore improving patient safety.

The patient with phlebitis has his cannula reviewed and removed. An incident report was completed by the patient's nurse and the incident number was recorded in the patient's healthcare record for future reference and the patient was notified of the incident. A review of the other two patients' notes identified the staff members that looked after them over the last few days and, through discussion with them, the NUM was able to discover when the cannula was inserted. The NUM has asked Poppy to complete another audit in a fortnight's time to measure any improvement.

Auditing should focus on the PHO's governance processes for quality and safety and not on individual performance. HAI auditing and frequency should be based on a risk management framework which aims to evaluate the systems and processes in place to control HAI risks to patient. Outcomes of audits can be evaluated through a combination of self-assessment and/or independent verification processes to assess improved patient care.

10.2.2 Auditing for the National Hand Hygiene Initiative

In alignment with NSQHS Standard 3.5, NSW PHOs must regularly audit the hand hygiene compliance of its workforce. To do this, NSW PHOs should use a method consistent with the National Hand Hygiene Initiative's 5 Moments for Hand Hygiene standard. This approach allows comparison of hand hygiene compliance within healthcare facilities and between professional groups at a facility level and comparison of hand hygiene compliance between facilities and local health districts and speciality health networks at a state level. NSW PHOs should refer to Hand Hygiene Australia (HHA) for further advice on the data collection process, clinical area selection and number of moments required for a facility, based on acute inpatient bed numbers.

[NSQHS Standard 3.5](#)

Developing, implementing and auditing a hand hygiene program consistent with the current national hand hygiene initiative

Hand Hygiene Australia, 2015

[Guidelines for data submission](#)

Hand hygiene compliance data from PHOs is added to the national database once validated by regional and state jurisdictional officers. Hand hygiene compliance data is also published on websites such as 'MyHospitals' where a PHO's aggregate hand hygiene compliance rate will be compared to the national interim benchmark.

MyHospitals, 2015

[Hand hygiene](#)

Hand Hygiene Australia,

[Latest National Data](#)

Results from hand hygiene auditing should be discussed in a relevant and timely fashion. Therefore it is imperative that a PHO's hand hygiene compliance report is generated locally and received by everyone, from the PHO senior executive team through to the healthcare workers from where the data was collected. The concept of frontline ownership of hand hygiene data is emerging as an important enabler of hand hygiene culture sustainability. It follows that clinical areas and their management are responsible for their own hand hygiene compliance results and as such, should engage in strategies to improve and invigorate the NHHI at a local level. Public display of ward and facility hand hygiene compliance results can act as a visual cue for clinical practice improvement and reinforce consumer awareness that hand hygiene is everyone's 'core business'.

Healthcare facilities may wish to track their progress in hand hygiene resources, promotion, and activities, plan their actions, and aim for improvement and sustainability through the use of the WHO Hand Hygiene Self-Assessment Framework. The framework is a tool with which to obtain a situation analysis of hand hygiene promotion and practices within an individual healthcare facility, according to a set of indicators. The WHO Hand Hygiene Self-Assessment Framework also acts as a diagnostic tool, identifying key issues requiring attention and improvement. Repeated use of the framework will allow documentation of progress with time.

WHO, 2010

[Hand Hygiene Self-Assessment Framework](#)

10.3 Incident Management and Notification

This section of the handbook refers specifically to the management of infection control critical incidents and the reporting of notifiable conditions and diseases. An incident can be described as any unplanned event resulting in, or with the potential for, injury, damage or other loss. Immediate local goals of incident management should be to identify, contain and document the incident. This includes:

- Advising line manager (who, in turn should ensure that the PHO's general manager and chief executive are advised of the incident);
- Preventing a repeat of the incident;
- Identifying the extent of the problem; and
- Completing notification in the Incident Management system.

NSQHS Actions 3.1.1

A risk management approach is taken when implementing policies, procedures and/or protocols for reporting of communicable and notifiable diseases

[NSW Health PD2014_004](#)
Incident Management Policy

10.3.1 Clinical Incident

In infection control, a clinical incident is concerned with the transmission or risk of transmission of microorganisms to an individual or group of patients and/or an individual or group of HCWs in the healthcare setting. A clinical incident involves a breach in infection control practices that can cause:

- Actual or potentially contaminated instruments/equipment from inadequate disinfection or sterilising processes that could lead to transmission of an infectious disease
- Provider-to-patient exposure from infected HCWs who perform EPPs on patients
- Any acute illnesses due to bloodborne pathogens that are likely to have been transmitted in a PHO

[NSW Health PD2017_013](#)
Infection Prevention and Control Policy

10.3.2 Lookback

Lookback is the process of notification, investigation and management of a critical incident. Specifically, Lookback involves:

- Identifying, tracing, communicating and providing appropriate ongoing advice to, and/or management of, the group of patients affected;
- Notification to appropriate bodies involving the NSW Ministry of Health and formation of a communication strategy;
- Notification to the wider public, if applicable; and,
- Evaluation or review of the Lookback process.

[NSW Health PD2007_075](#)
Lookback Policy

The PHO Chief Executive is responsible for initiation of the Lookback process. Timely and appropriate management of the critical incident should begin within 24 hours of the incident being notified. An effective Lookback procedure requires effective communication at all levels and include PHUs.

A PHO must, as mandated by the NSW Health *Lookback Policy* ([PD2007_075](#)), undertake a Lookback should one the following HAI critical incidents occur:

- Exposure to a HCW with a bloodborne virus
- Contamination of breast milk or administration to the wrong infant.

[NSW Health PD2010_019](#)
Maternity - Breast Milk: Safe Management

[NSW Health Safety Advocate 7](#)
Self Management of Breastmilk

Other HAI critical incidents that may require the PHO to undertake Lookback include incidents that involve inadequately reprocessed equipment and/or instruments.

[NSW Health PD2005 162](#)
HIV, Hepatitis B or Hepatitis
C - Health Care Workers
Infected

The NSW Bloodborne Advisory Panel is a group of clinicians who provide advice to PHOs on a number of matters including sterilization breaches and incidents as well as patients who have been exposed to staff members' body fluids. For advice from the NSW Bloodborne Advisory Panel contact the Health Protection Unit in the NSW Ministry of Health.

10.3.3 Open disclosure

Open disclosure is a process for ensuring that open, honest, empathic and timely discussions occur between patients and/or their support person(s) and PHO staff following a patient safety incident. Open disclosure is:

- A patient's and consumer's right
- A core professional requirement of ethical practice and an institutional obligation
- A normal part of an episode of care should the unexpected occur and a critical element of clinical communications
- An attribute of high quality health services and an important part of health care quality improvement

[NSW Health PD2014 028](#)
Open Disclosure Policy

10.4 Reporting of notifiable disease

Medical practitioners and hospitals are required to report notifiable conditions to their local PHUs on the basis of reasonable clinical suspicion.

Section 11
[Outbreak Management](#)

Case notification should be initiated within 24 hours of diagnosis either by telephone or in writing. Information for each notifiable disease and condition is available from the following link:

- [Disease notification for doctors, hospitals and laboratories;](#)

ESTABLISH THE CONTEXT

IDENTIFY INFECTION RISKS

ASSESS THE RISK OF INFECTION

CONTROL THE RISK OF INFECTION

REVIEW EFFECTIVENESS OF CONTROL MEASURES

An outbreak is defined as cases of disease in excess of what would normally be expected within a defined population. This includes single cases of some diseases which have been eliminated from Australia such as measles. It is recommended that local outbreak response procedures are developed that include outbreak definitions, reporting lines and mitigation strategies. Local outbreak response procedures need to be implemented in the event of an outbreak.

[Section 9.9.1](#)
Using extended paramedic services in residential aged care facilities

Table 15 describes the common disease outbreaks encountered in hospital settings.

Table 15. Common disease outbreaks in hospitals

Disease	Outbreak definition	Comments	Additional guidance
Gastroenteritis	Two or more cases* of diarrhoea and/or vomiting in a 24 hour period that are epidemiologically related in time, place or person.	Gastroenteritis can be caused by a variety of different bacteria, viruses or parasites. Pathogens can be spread by direct person to person transmission, consumption of contaminated foods or water or contact with contaminated surfaces. Illness is usually self-limited and requires supportive treatment. Gastroenteritis outbreaks in institutions are notifiable to your local PHU under the <i>Public Health Act 2010</i> .	Communicable Diseases Network Australia (CDNA) Guidelines for the public health management of gastroenteritis outbreaks due to norovirus or suspected viral agents in Australia NSW Health: Gastro Pack for Hospitals NSW Health Disease notification: Information sheet
Influenza	Three or more epidemiologically linked cases* of influenza-like illness (ILI) in a healthcare facility within a period of 72 hours PLUS at least one case having a positive laboratory test OR at least two cases having a positive point of care test. <i>Potential influenza outbreak alert:</i> Three or more cases* of ILI in a healthcare facility within a period of 72 hours.	Antiviral medications may be indicated for treatment of cases and prophylaxis of high risk contacts. High risk contacts include: - individuals aged over 65 years - immunocompromised individuals - pregnant women - residents of long term care facilities - Aboriginal and Torres Strait Islander people	Communicable Diseases Network Australia (CDNA) Guidelines for the Prevention, Control and Public Health Management of Influenza Outbreaks in Residential Care Facilities in Australia NSW Health Control Guideline: Influenza
Pertussis	Two or more cases* which share a plausible epidemiological link e.g. clustered in time and place (such as in the same room, ward or similar confined setting where transmission is suspected to have occurred in that setting).	A single case in a HCW or patient in a maternity ward or newborn nursery should be responded to in the same manner as an outbreak. Pertussis cases are notifiable to your local PHU under the <i>Public Health Act 2010</i> .	NSW Health Control Guideline: Pertussis NSW Health Disease notification: Information sheet
Measles	A single suspected, probable or confirmed case in a HCW or patient in a healthcare facility.	Appropriate isolation in ED/wards. Airborne precautions. Measles cases are notifiable to your local PHU under the <i>Public Health Act 2010</i> .	NSW Health Control Guideline: Measles NSW Health Disease notification: Information sheet
Scabies	Two or more cases* epidemiologically linked within a six week period of each other.	Treatment and isolation of cases should occur concurrently. Isolate for 24 hours after first treatment.	NSW Health factsheet: Scabies Australian Guidelines for the Prevention and Control of Infection in Healthcare
Chickenpox	Two or more cases* which share a plausible epidemiological link e.g. clustered in time and place (such as in the same room, ward or similar confined setting where transmission is suspected to have occurred in that setting).	Individuals at high risk of complications from chickenpox include pregnant women who are not immune, newborn babies and some immunosuppressed individuals. Varicella-zoster immunoglobulin can prevent illness if given within 96 hours from exposure.	The Australian Immunisation Handbook: Varicella

* Case can be patient or healthcare worker (HCW)

11.1 Outbreak investigation and management

One of the purposes of surveillance is to predict and minimise the harm caused by an outbreak situation. The key principles of outbreak surveillance are:

- Recognising the outbreak.
- Reporting the outbreak (including onset dates, symptoms and initiated infection prevention strategies) by the nurse unit manager (or their delegate) to the local infection prevention and control service, executive management team, bed managers, pathology laboratories and the local PHU.
- Formation of an outbreak management team which is appropriate to the size and staffing of the facility. This may include the nurse unit manager, cleaning manager, clinical microbiologist, infection prevention and control service, PHO executive and PHO media liaison.
- Documenting cases on a time line or line list.
- Isolation or cohorting of cases to limit the spread of the outbreak.
- Specimen collection to define cause of outbreak.
- Monitoring or prophylaxis of contacts.
- Setting up communication channels within the PHO for regular outbreak updates.

Case study 10 - An outbreak in Ward 3B

On a cold Monday morning in July, Ward 3B rang Infection Prevention and Control to notify three patients who had all started having vomiting and diarrhoea symptoms over the weekend. The ward was reminded to isolate or cohort the patients away from other patients on the ward, collect stool samples to send for testing and ensure the staff use PPE when caring for these patients. The infection prevention and control CNC visited Ward B at around midday and it was noted that the ward had put up signs to alert visitors that they were currently experiencing a gastroenteritis outbreak and to re-consider the need to visit at this time. Fact sheets on viral gastroenteritis were made available to HCWs, patients and visitors, and there was extra PPE outside the rooms of patients affected for HCWs to use.

A line list of cases was started to report to the local PHU in accordance with [NSW Health Control Guidelines](#). The line list detailed the cases' onset dates, symptoms and specimen details. Click [here](#) for NSW Health line listing template.

NSW HEALTH

NSW Health Hospital Gastro Pack Section 5: Line Listing for Gastroenteritis in a Hospital (page 1)

Name of Hospital: Sunshine Hospital Name of ward/s or unit/s: 3B No patients on ward/unit: 35 No. of staff: 30
 Contact Person: _____ Position Title: _____ Telephone No: _____ Fax No: _____ Email: _____
 PHU Notified (tick) Date Reported to PHU: _____ Date First Case: _____ Unique name/number for outbreak (PHU to fill in): _____

CASE DETAILS				DESCRIPTION OF ILLNESS					SPECIMEN		OUTCOME		
Case No.	Full name & MRN	DOB & Age (yrs)	Gender	Staff (S) or Patient (P)	Current Ward/ Bed	Date of Onset	Time of Onset	Length of illness (hrs)	Symptoms (see key)	Specimen Collected (Y/N) if Yes, specify type	Date Specimen Collected	Result (specify name of bacteria, virus, parasite or toxin)	Recovered (R) Died (D)
1	William Black 225334	23/09/43	M	P	Bed 12	4/07	9am	48hrs	D, V	Y	06/07		
2	Gary Brown 2233221	04/08/45	M	P	Bed 13	5/07	2am	3 days	D, V, F	Y	06/07		
3	Bob Smith 7766224	05/02/60	M	P	Bed 11	5/07	6am	2 days	D, V	Y	06/07		

Symptoms Key: V=Vomiting D=Diarrhoea BD=Bloody Diarrhoea F=Fever>38.5C AC=Abdominal Cramps N=Nausea

Please use the same Line Listing for new cases – do not start a new one each day
 Please arrange stool samples (specimens) from affected persons

Information Pack for Gastroenteritis in a Hospital December 2010

The formation of an outbreak team in the hospital was not considered necessary as the outbreak was small and being managed appropriately by Ward B.

On Tuesday one more patient and two HCWs reported symptoms. The patient was isolated and the HCWs were advised to remain off work until 48 hours after their symptoms had ceased. All details were added to the line list and faxed to the public health unit.

NSW HEALTH

NSW Health Hospital Gastro Pack Section 5: Line Listing for Gastroenteritis in a Hospital (page 1)

Name of Hospital: Sunshine Hospital Name of ward/s or units: 3B No patients on ward/unit: 35 No. of staff: 30
 Contact Person: _____ Position Title: _____ Telephone No: _____ Fax No: _____ Email: _____
 PHU Notified (tick) Date Reported to PHU: _____ Date First Case: _____ Unique name/number for outbreak (PHU to fill in): _____

CASE DETAILS				DESCRIPTION OF ILLNESS					SPECIMEN			OUTCOME	
Case No.	Full name & MRN	DOB & Age (yrs)	Gender	Staff (S) or Patient (P)	Current Ward/ Bed	Date of Onset	Time of Onset	Length of Illness (hrs)	Symptoms (see key)	Specimen Collected (Y/N) If Yes, specify type	Date Specimen Collected	Result (specify name of bacteria, virus, parasite or toxin)	Recovered (R) Died (D)
1	William Black 225334	23/09/43	M	P	Bed 12	4/07	9am	48hrs	D, V	Y	06/07		
2	Gary Brown 2233221	04/08/45	M	P	Bed 13	5/07	2am	3 days	D, V, F	Y	06/07		
3	Bob Smith 7766224	05/02/60	M	P	Bed 11	5/07	6am	2 days	D, V	Y	06/07		
4	Mary Burke	05/09/85	F	S		6/07	11am	2 days	D, V	N			
5	Tim Styles	25/06/90	M	S		6/07	6pm	1 day	D	Y	07/07		
6	John Ward 7766553	5/08/55	M	P	Bed 10	6/07	9pm	3 days	D, V	N			

Symptoms Key: V=Vomiting D=Diarrhoea BD=Bloody Diarrhoea F=Fever>38.5C AC=Abdominal Cramps N=Nausea

Please use the same Line Listing for new cases – do not start a new one each day
 Please arrange stool samples (specimens) from affected persons
 Information Pack for Gastroenteritis in a Hospital

December 2010

On Wednesday three stool samples came back positive for norovirus and one was positive for norovirus and *C. difficile*. The *C. difficile* was considered an incidental finding and the outbreak was reported as being caused by norovirus.

By Thursday afternoon there had been no more cases reported for more than 24 hours. After discussion with the outbreak team the outbreak was considered over. Patients were released from isolation, terminal cleaning was performed and work on Ward B returned to normal. A final line list completed with all stool sample results was faxed to the PHU.

NSW HEALTH

NSW Health Hospital Gastro Pack Section 5: Line Listing for Gastroenteritis in a Hospital (page 1)

Name of Hospital: Sunshine Hospital Name of ward/s or units: 3B No patients on ward/unit: 35 No. of staff: 30
 Contact Person: _____ Position Title: _____ Telephone No: _____ Fax No: _____ Email: _____
 PHU Notified (tick) Date Reported to PHU: _____ Date First Case: _____ Unique name/number for outbreak (PHU to fill in): _____

CASE DETAILS				DESCRIPTION OF ILLNESS					SPECIMEN			OUTCOME	
Case No.	Full name & MRN	DOB & Age (yrs)	Gender	Staff (S) or Patient (P)	Current Ward/ Bed	Date of Onset	Time of Onset	Length of Illness (hrs)	Symptoms (see key)	Specimen Collected (Y/N) If Yes, specify type	Date Specimen Collected	Result (specify name of bacteria, virus, parasite or toxin)	Recovered (R) Died (D)
1	William Black 225334	23/09/43	M	P	Bed 12	4/07	9am	48hrs	D, V	Y	06/07	norovirus	R
2	Gary Brown 2233221	04/08/45	M	P	Bed 13	5/07	2am	3 days	D, V, F	Y	06/07	Norovirus c.difficile	R
3	Bob Smith 7766224	05/02/60	M	P	Bed 11	5/07	6am	2 days	D, V	Y	06/07	norovirus	R
4	Mary Burke	05/09/85	F	S		6/07	11am	2 days	D, V	N			R
5	Tim Styles	25/06/90	M	S		6/07	6pm	1 day	D	Y	07/07	Norovirus	R
6	John Ward 7766553	5/08/55	M	P	Bed 10	6/07	9pm	3 days	D, V	N			R

Symptoms Key: V=Vomiting D=Diarrhoea BD=Bloody Diarrhoea F=Fever>38.5C AC=Abdominal Cramps N=Nausea

Please use the same Line Listing for new cases – do not start a new one each day
 Please arrange stool samples (specimens) from affected persons
 Information Pack for Gastroenteritis in a Hospital

December 2010

11.2 Outbreak management in community settings

Early identification and control of infectious diseases can minimise the potential for an outbreak of an infectious disease. In the event of an outbreak, notification to relevant stakeholders and implementation of appropriate control strategies will facilitate outbreak management. In the event of a suspected or identified outbreak, notification to managers and the local infection prevention and control unit should occur as a priority. HCWs are to implement appropriate precautions, including performing hand hygiene with soap and water for *C. difficile* and norovirus, and use of appropriate PPE. The local infection prevention and control service is to notify the PHU and appropriate executive management and implement containment, monitoring and investigation strategies in conjunction with PHU. Refer to local outbreak management flowchart.

Case Study 11: Lily's story - Outbreaks in the field

Lily is a Child and Family Health Nurse who developed respiratory symptoms including a persistent paroxysmal cough. Five years ago, Lily was vaccinated for pertussis.

A week after the onset of her symptoms, Lily's cough had not improved so Lily made an appointment to see her GP. A nasopharyngeal swab was collected and sent to the laboratory for nucleic acid testing, also known as PCR. Two days later Lily was notified by her GP that she returned a positive swab result for pertussis and was commenced on Azithromycin.

Lily notified her Nursing Unit Manager who informed the local infection prevention and control service. An Infection Prevention and Control nurse contacted Lily to obtain a history, verify the diagnosis and compile a list of contacts in consultation with the local PHU in accordance with the [NSW Health Control Guideline for Pertussis](#).

In accordance with this guideline, five babies were identified as close contacts because they:

- a) had contact of less than 1 metre with Lily during the infectious period for more than one hour; and
- b) were under six months of age.

Four HCWs, regardless of their vaccination status, were defined as close contacts because they:

- a) had contact of less than 1 metre with Lily during the infectious period for more than one hour; and
- b) worked with infants who were less than six months of age.

No pregnant contacts in the last month of pregnancy were identified.

All close contacts were contacted by the PHU and advised to attend a predetermined clinic organised by the PHU for assessment and antibiotic prophylaxis. Those who could not attend the clinic were advised to contact their GP.

The event was used to review all staff members' vaccination status and update where required.

The executive management for the community health service were notified and a Brief regarding action taken was later forwarded.

11.3 Emerging infectious diseases

11.3.1 Respiratory viruses

The threat of emerging respiratory viruses such as SARS and MERS-CoV are a potential cause of concern for the health system. The difficulty about the emergence of these viral infections is that no one can predict where and when the next epidemic will occur.

PHOs should follow the disease specific NSW Health control guidelines in the event of a respiratory virus outbreak.

Communicable Diseases Network Australia (CDNA)
[Guidelines for the Prevention, Control and Public Health Management of Influenza](#) Outbreaks in Residential Care Facilities in Australia
NSW Health
[MERS-Coronavirus Control Guidelines for PHUs](#)
[SARS Control Guidelines](#)
[Influenza Control Guidelines for PHUs](#)

[Australian Guidelines for the Prevention and Control of Infection in Healthcare](#)

11.3.2 Viral haemorrhagic fevers

Viral haemorrhagic fevers (VHFs) refer to a group of illnesses that are caused by several distinct families of viruses. VHFs are severe and life-threatening viral diseases that are endemic to parts of Africa, the Middle East, Eastern Europe and Asia. VHFs are not indigenous to Australia and environmental conditions here are unlikely to support the natural reservoirs and vectors of any of the haemorrhagic fever viruses. VHFs are caused by viruses of four distinct families:

1. Arenaviruses: Lassa Fever, Junin and Machupo
2. Filoviruses: Ebola and Marburg
3. Bunyaviruses: Crimean-Congo haemorrhagic fever, Rift Valley Fever, Hantaan haemorrhagic fevers; and
4. Flaviviruses: Yellow fever, Dengue, Omsk haemorrhagic fever, Kyasanur Forest disease.

[NSW Health GL2016_002](#)
NSW Contingency Plan for Viral Haemorrhagic Fevers

NSW Health
[Viral Haemorrhage Fevers](#)

VHFs are of particular public health importance because:

- they can spread via human-to-human contact
- they present a particular transmission risk within a hospital setting
- they are often associated with a high case fatality rate
- they can have a long asymptomatic incubation phase
- there is no clear differential symptomatology for these infections
- they are difficult to test for
- there are few if any effective treatments

VHFs are notifiable infectious diseases and scheduled medical conditions under the NSW Public Health Act (2010). VHFs are prescribed diseases under the Quarantine Act 1908 (Commonwealth) and its proclamations, with four VHFs (Crimean–Congo, Ebola, Lassa and Marburg viral haemorrhagic fevers) listed as quarantinable.

[NSW Health Public Health Act 2010](#)

[Quarantine Act 1908](#)

[NSW Health GL2016_002](#)
NSW Contingency Plan for Viral Haemorrhagic Fevers

PHOs should follow the NSW VHF contingency plan for suspected and confirmed VHF cases.

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