

Infection Control Policy

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Functional Sub group Clinical/ Patient Services - Infectious diseases
Population Health - Infection Control
Personnel/Workforce - Occupational Health & Safety

Summary NSW Health is committed to ensuring the health and safety of all patients and visitors in health care settings. This document outlines the broad principles of infection control and is intended as a framework within which Area Health Services and health care facilities can develop comprehensive operational infection control policies and procedures appropriate to their own organisation.

The redesigned PDF was uploaded on 3/9/2007 - the policy content has not changed.

Section 2.1.1 Hand Hygiene was replaced by a stand alone policy PD2010_058 on 13/9/2010 as advised in information bulletin IB2010_049

Replaces Doc. No. Infection Control Policy [PD2005_247]
Tuberculosis - Infection Control [PD2005_596]
Colour Coding of Cleaning Equipment [PD2005_097]

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Applies to Area Health Services/Chief Executive Governed Statutory Health Corporation, Board Governed Statutory Health Corporations, Affiliated Health Organisations - Non Declared, Affiliated Health Organisations - Declared, Public Health System Support Division, Community Health Centres, Dental Schools and Clinics, NSW Ambulance Service, NSW Dept of Health, Private Hospitals and Day Procedure Centres, Public Health Units, Public Hospitals

Audience All staff

Distributed to Public Health System, Community Health Centres, Dental Schools and Clinics, Divisions of General Practice, Environmental Health Officers of Local Councils, Government Medical Officers, Health Associations Unions, Health Professional Associations and Related Organisations, NSW Ambulance Service, NSW Department of Health, Public Health Units, Public Hospitals, Private Hospitals and Day Procedure Centres

Director-General

This Policy Directive may be varied, withdrawn or replaced at any time. Compliance with this directive is **mandatory** for NSW Health and is a condition of subsidy for public health organisations.

Review date 23-May-2010

Infection control policy



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This policy applies to all staff employed in the nsw health service. In addition, as the determination of conditions of subsidy requires (to the extent permitted by law) non declared affiliated health organisations to comply with policy directives issued by the department dealing with terms and conditions of employment of staff employed in the nsw health service, the policy is to be applied across the nsw public health system.

Associated and superseded policy documents

This Policy Document should be read in conjunction with the following NSW Department of Health Policy Directives and Guidelines:

PD2007_006	Occupational Assessment, Screening and Vaccination Against Specified Infectious Diseases	PD2005_203	Management of Reportable Infection Control Incidents
PD2005_609	Patient Safety and Clinical Quality Program Implementation Plan	PD2005_162	HealthCare Workers Infected with HIV, Hepatitis B or Hepatitis C
PD2005_608	Patient Safety and Clinical Quality Program	PD2005_132	Waste Management Guidelines for HealthCare Facilities
PD2005_490	Policy Framework and Guidelines for the Prevention and Management of Latex Allergy	PD2005_108	Policy and Guidelines for the Safe Use of Glutaraldehyde in NSW Public HealthCare Facilities
PD2005_414	Infection Control Program Quality Monitoring	PD2006_070	Lookback
PD2005_399	Remanufacture of Single Use Medical Devices	PD2006_030	Incident Management Policy
PD2005_354	Workcover NSW Reporting Requirements: Occupational exposure to Blood Borne Pathogens	NSW Health	Cleaning Service Standards, Guidelines and Policy for NSW Health Facilities 1996
PD2005_352	Coroner's cases and amendments to <i>Coroners Act 1980</i>	GL2007_003	Health Facility Guidelines – NSW Health
PD2005_311	Management of HealthCare Workers Potentially Exposed to HIV, Hepatitis B and Hepatitis C	GL2005_037	Infection Control Guidelines for Oral HealthCare Settings
PD2005_234	Effective Incident Response: A Framework for Prevention and Management in the Health Workplace	PD2007_033	Infection Control Policy – Animals as Patients in Health Organisations
			This Infection Control Policy supersedes the following Policy Documents:
		PD2005_596	Infection Control (related to tuberculosis)
		PD2005_247	Infection Control Policy
		PD2005_097	Colour Coding of Cleaning Equipment

Glossary

Additional (transmission based) Precautions

Are designed for patients known or suspected to be infected with pathogens for which additional precautions beyond Standard Precautions are needed to interrupt transmission in health organisations. Additional Precautions are also designed to protect immunocompromised patients from acquiring healthcare associated infections whilst in protective isolation.

Alcohol-based hand rub/gel

An alcohol-containing preparation designed for reducing the number of viable micro-organisms on the hands.

Antimicrobial soap

A detergent containing an antimicrobial agent.

Antimicrobial

A germicide used on skin or living tissue for the purpose of inhibiting or destroying micro-organisms (eg alcohols, chlorhexidine, chlorine, hexachlorophene, iodine and triclosan).

Aseptic

Free of pathogenic micro-organisms; methods to protect against infection by pathogenic micro-organism.

Automated endoscopic disinfectant

A machine that is used for the reprocessing of endoscopes that allows exposure of all internal and external surfaces to a disinfectant or chemical sterilant.

Body substance

Body substance is used rather than body fluid to emphasise the need for precautions to prevent contact with solid tissue and faeces as well as body fluids.

Creutzfeldt-Jakob disease (CJD)

Is a rapidly progressive, invariably fatal neurodegenerative disorder believed to be caused by an abnormal isoform of a cellular glycoprotein known as the prion protein.

Decontamination

Is a process that renders equipment, or environmental surfaces safe to handle by cleaning and disinfection or sterilization.

Disinfection

Destruction of pathogenic and other kinds of micro-organisms by thermal or chemical means. Disinfection is less lethal than sterilization, because it destroys the majority of recognised pathogenic micro-organisms, but not necessarily all microbial forms (eg bacterial spores). Disinfection does not ensure the degree of safety associated with sterilization processes.

Droplet nuclei

Particles <5µm in diameter formed by dehydration of airborne droplets containing micro-organisms that can remain suspended in the air for long periods of time.

Droplets

Small particles of moisture (eg spatter) generated when a person coughs or sneezes, or when water is converted to a fine mist by an aerator or showerhead. These particles, intermediate in size between drops and droplet nuclei, can contain infectious micro-organisms and tend to quickly settle from the air such that risk of disease transmission is usually limited to persons in close proximity to the droplet source.

Germicide

An agent that destroys micro-organisms, especially pathogenic organisms. Terms with the same suffix (eg virucide, fungicide, bactericide, tuberculocide, and sporicide) indicate agents that destroy the specific microorganism identified by the prefix. Germicides can be used to inactivate micro-organisms in or on living tissue (ie antimicrobials) or on environmental surfaces (ie disinfectants).

Hand hygiene

General term that applies to hand washing, antimicrobial hand wash, antimicrobial hand rub, or surgical hand antisepsis.

Healthcare associated infection (nosocomial)

An infection acquired in a hospital or healthcare setting. The definition encompasses those infections, occurring as a result of healthcare interventions, which may manifest before or after discharge from a healthcare setting.

Hepatitis B surface antigen (HBsAg)

A serologic marker on the surface of hepatitis B virus which can be detected in high levels in serum during acute or chronic hepatitis.

High-level disinfection

Disinfection process that inactivates vegetative bacteria, mycobacteria, fungi, and viruses but not necessarily high numbers of bacterial spores.

Implantable device

Device placed into a surgically or naturally formed cavity of the human body and intended to remain there for >30 days.

Infection control risk management

A systematic approach towards identifying, managing and minimising exposure to sources of infection risks in the health organisation.

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.

Personal protective equipment (PPE)

Refers to a variety of infection control barriers and respirators used alone, or in combination, to protect mucous membranes, skin, and clothing from contact with recognised and unrecognised sources of infectious agents in healthcare settings.

Qualitative fit test

A facial fit test conducted to assess the fit of a P2 mask giving pass/fail results and relying on the subject's response to a test agent.

Quantitative fit test

A facial fit test conducted to assess the fit of a P2 mask giving numerical results and not relying on the subject's response to a test agent.

Sharp

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 designed to the relevant Australian Standard, for the disposal of sharps.

Standard precautions

Precautions designed to reduce the risk of transmission of micro-organisms from both recognised and unrecognised sources of infection in healthcare settings.

Sterile

Free from all living micro-organisms, usually described as a probability (eg the probability of a surviving microorganism being 1 in 1 million).

Sterilization

The destruction of all living organisms, including spores.

Ultrasonic cleaner

Device that removes debris by a process called cavitation, in which waves of acoustic energy are propagated in aqueous solutions to disrupt the bonds that hold particulate matter to the surfaces of medical devices.

Washer-disinfector

Automatic unit that cleans and thermally disinfects instruments, by using a high-temperature cycle rather than a chemical bath.

Definitions

In this document the term:

healthcare worker: refers to staff specifically practising in clinical settings of the health organisation, such as practitioners, and is interchangeable with “staff”

must: indicates a mandatory practice required by law or by departmental directive. A departmental directive is only issued where it is considered necessary in the interests of patient and healthcare worker safety

NSW Health Service: consists of staff employed in all Area Health Services, all statutory health corporations, the Ambulance Service of NSW, Institute of Medical Education and Training, Health Technology, Health Support and any declared affiliated health organisations

NSW public health system: consists of all Area Health Services, all statutory health corporations, all affiliated health organisations in respect of their recognised services, the Ambulance Service of NSW, Institute of Medical Education and Training, Health Technology and Health Support

organisation: refers to any entity that is part of the NSW public health system

patient: includes all consumers of healthcare in NSW including residents in nursing homes and long term care health organisations

should: indicates a strongly recommended practice

staff: refers to any person working in a permanent, temporary, casual-termed appointment or honorary capacity within NSW Health. It includes volunteers, patient advocates, contractors, visiting practitioners, students, consultants and researchers performing work within NSW Health organisations.

Introduction

1.1 Background

NSW Health is committed to ensuring the health and safety of all patients and visitors in healthcare settings and providing a safe and healthy working environment for all staff. This commitment includes adopting an infection control policy position that minimises the risk of healthcare consumers and providers acquiring a healthcare associated or occupational infection. This goal is best achieved by having an evidence based infection control program within each health organisation.

1.2 Purpose

This document outlines the broad principles of infection control for the NSW public health system, licensed private hospitals, extended care organisations, and day procedures centres. It is intended as a framework within which the NSW health service can develop comprehensive operational infection control policies and procedures appropriate to their own health organisation.

Variation in the type of public and licensed private health organisations in NSW, and the range of clinical services provided in each health organisation, dictate that locally applicable infection control programs and policies be developed and implemented that specifies performance standards for routine work practices and procedures.

1.3 Legislative requirements

Key elements of the infection control policy continue to be incorporated in regulations that define the registration requirements for medical practitioners, nurses, midwives, physiotherapists, dentists, dental technicians and podiatrists in NSW. Under the relevant *Act*^{1,2,3,4,5,6} a practitioner must not, without "reasonable excuse", fail to comply with the infection control regulations. The key elements constitute the minimum standard for infection control in all NSW public and licensed private healthcare settings. *AS/NZS 4187 Cleaning, disinfecting and sterilizing reusable medical and surgical instruments and equipment,*

*and maintenance of associated environments in healthcare facilities,*⁷ and *AS/NZS 4815 Office-based healthcare facilities – reprocessing of reusable medical and surgical instruments and equipment, and maintenance of the associated environment,*⁸ must also be complied with under these regulations.

All health organisations and healthcare workers (HCWs) have a common law duty of care to take all reasonable steps to safeguard patients, staff and the general public from infection. The *Occupational Health and Safety (OH&S) Act 2000*,⁹ prescribes the employer's duty of care to provide a safe and healthy working environment for all employees and other persons on their premises. The *OH&S Act* also prescribes responsibilities for managers (who manage OH&S within the areas that they control and influence) and employees (who must cooperate with the employer and not put anyone at risk by their acts or omissions). There is also a requirement for employers to provide the information, instruction, training and supervision necessary to ensure the health and safety of employees at work.

1.4 Clinical governance^{10,11}

Clinical governance is a framework that supports and promotes clinician driven accountability for quality improvement in healthcare. The delivery of clinical governance focuses on the corporate strategic directions of the health organisation, planning for quality process management and effective use of information to support policymaking. The elements of clinical governance within infection control are:

- clear lines of clinician accountability and responsibility
- establishment of a framework for infection control service delivery consistent with strategic directions articulated at the health organisation and corporate level
- presence of a comprehensive program for patient quality and safety improvement activities
- clear policies to manage healthcare associated infection risk

- a structure that facilitates the identification of areas requiring corrective action and evaluation.

1.5 Infection control risk management

To be read in conjunction with:

- AS/NZS 4360: *Risk Management*; and the accompanying Handbook
- HB436: *Risk Management Guidelines – Companion to AS/NZS 4360*.

The NSW public health system and licensed private health organisations must have systems in place to minimise the risk of preventable healthcare associated infection (HAI) in order to deliver healthcare in a safe and cost effective manner. The risk management process can be used to highlight health organisation specific infection control matters. This enables appropriate resource deployment to manage the identified risks and improve the safety and quality of patient care.

1.5.1 Infection control risk management plan

Each health organisation should have an Infection Control Risk Management Plan. Program design will be dependent on the context of care provision and identified infection risks.

Once infection risks are identified for both patients and HCWs, and depending on the nature of specific risks, the risk management program may include:

- eliminating the risk factors
- modifying or changing procedures, protocols and work practices
- monitoring HCWs and patient compliance with infection control procedures
- providing information/education and training to patients and HCWs.

Elements of the risk management process are outlined in AS/NZS 4360 and PD2005_409: *Workplace Health and Safety: Policy and Better Practice Guide*.

1.6 Infection control practices during public health emergencies

Specific infection control guidelines have been, and will continue to be, developed in response to these public health emergencies and will be made available to all health organisations either by NSW Health or the Australian Government Department of Health and Ageing.

SECTION 2

Infection control process

Consistent with national and international requirements, a two-tiered approach to infection control precautions is endorsed. The first tier includes those precautions designed for the care of all patients, regardless of their diagnosis or presumed infection status. These precautions are known as **Standard Precautions** and constitute the minimum acceptable level of infection control practice.

The second tier includes precautions that are applicable only for the care of specified patients and are known as **Additional (Transmission Based) Precautions**.

2.1 Standard precautions (Tier 1)

Standard Precautions apply to all patients receiving care in health organisations, regardless of their diagnosis or presumed infection status.

Standard Precautions apply to:

- blood (including dried blood)
- all body substances, secretions and excretions (excluding sweat), regardless of whether or not they contain visible blood
- non-intact skin
- mucous membranes including eyes.

Standard Precautions are designed to reduce the risk of transmission of micro-organisms from both recognised and unrecognised sources of infection in health organisations.

Standard Precautions involve the use of safe work practices and protective barriers including:

- hand hygiene
- appropriate use of gloves
- use of facial protection
- use of masks
- use of gowns/aprons
- appropriate device handling

- appropriate handling of laundry
- incorporation of respiratory hygiene/cough etiquette.

The type of Personal Protective Equipment (PPE) used will vary based on the level of precautions required.

2.1.1 Hand hygiene

Hand hygiene is the single most important practice to reduce the transmission of infectious agents in healthcare settings.¹² The term “hand hygiene” includes both hand washing with running water and either plain or antimicrobial-containing liquid soap or the use of water-free skin cleansers or antimicrobials such as alcohol-based products. Hands must be cleaned with soap and running water if visibly soiled or in circumstances where antimicrobial water-free skin cleansers are demonstrated to be inadequate, such as caring for patients with *Clostridium difficile*.^{13,14,15}

Depending on the procedure to be performed, clothing worn by healthcare workers must allow for adequate and efficient cleaning of the arms and forearms.

The frequency, duration and type of hand hygiene are dependent upon the nature, intensity, duration and sequence of the work activity (table 1).^{16,17,18}

2.1.1.1 Situations requiring hand hygiene

Hand hygiene must be performed immediately in the following situations:¹⁶

- when starting and finishing work
- before and after going to the toilet, smoking and eating
- if skin is contaminated or visibly soiled with body substances
- following contact with own mucous membranes (eg blowing nose, sneezing or coughing into hands)
- following contact with non intact skin, and/or abnormal skin conditions (rashes)

- before donning gloves and after removing gloves
- before and after removing facial and eye protection (eg mask, shield or visor)
- after removing a gown or apron
- before and after patient care procedures
- between different procedures on the same patient
- before and after direct patient contact (except when urgent and emergency patient treatment is necessary and washing facilities are not readily available)
- after touching inanimate objects that are likely to be contaminated (eg computer keyboards, medical record notes, telephone, bed rails, urinals, bed pans)
- prior to food preparation, infant formula preparation, handling patient food or feeding patients
- after touching animals.

Table 1. Hand hygiene guidelines^{16,19}

Type	Duration	Skin cleaning product
Routine/social	10–15 seconds	Non-antimicrobial liquid soap and water to remove transient micro-organisms.
	10–15 seconds, and until dry	Water-free skin cleanser (alcohol based) hand rub, gel or foam. Rub vigorously over all surfaces and allow product to completely dry on hands without wiping.
Procedural (Non-surgical procedures)	30–60 seconds	Antimicrobial liquid soap and water, prior to invasive and aseptic procedures.
	30 seconds minimum	Alcohol based water-free skin cleanser (must have a proven residual affect).
Surgical	5 minutes prior to first operative procedure for the day, then 3 minutes prior to subsequent operative procedures	Antimicrobial liquid soap and water.

Manufacturer’s recommendations must be followed for the amount of solution and duration.

Table 2. Antimicrobial characteristics of hand hygiene agents

Group	Gram-positive bacteria	Gram-negative bacteria	Mycobacteria	Fungi	Viruses	Spore forming bacteria	Speed of Action
Alcohols 60% to 95%	+++	+++	+++	+++	+++	–	Fast
Chlorhexidine 2% and 4% aqueous	+++	++	+	+	+++	–	Intermediate
Iodophors	+++	++	+	++	++	–	Intermediate
Triclosan	+++	++	+	–	+++	–	Intermediate

Note +++=excellent; ++=good, but does not include entire spectrum; += fair; – = very poor or limited.

Adapted from Boyce and Pittet, 2002, Infection Control and Hospital Epidemiology

2.1.1.2 **Drying hands**

Hands must be dried after washing as the residual moisture left on the hands may harbour bacteria.²⁰ Alcohol based water-free skin cleansers must be allowed to dry (evaporate) appropriately by rubbing vigorously.

Paper towels or single use cloth towels must be used to dry hands in clinical and food preparation areas.¹⁶

Hot air hand dryers are not recommended in health organisations and should not be installed in healthcare worker or visitor toilet areas.²¹

2.1.1.3 **Glove use and hand hygiene**

The wearing of gloves does not eliminate the need for hand hygiene. Gloves cannot be guaranteed to provide complete protection against viral or bacterial contamination of the hands.¹³ If gloves are torn or compromised in any way during patient care or procedures they must be removed and hand hygiene performed before donning a new pair of gloves.²²

2.1.1.4 **Hand washing facilities**

The NSW Healthcare Facility Guidelines²¹ (section D – Infection Control and Prevention) outlines the requirements for hand washing facilities and can be accessed online at: <http://www.healthdesign.com.au/nsw.hfg/guidelines.htm>

Consideration must be given to the placement of alcohol based water-free skin cleansers. Availability of hand hygiene products close by patients and patient care areas has been associated with substantial improvement in adherence to hand hygiene.¹⁶

2.1.1.5 **Dispensers**

Liquid hand hygiene dispensers with disposable cartridges and nozzles are preferable. A cleaning schedule for reusable dispensers, that includes all mechanisms and mounting brackets, must be undertaken at each health organisation, as dispensers have been implicated as sources of infection.¹⁶

2.1.1.6 **Hand care**

Skin that is intact, without cuts, abrasion or lesions, is a natural defence against infection. Healthcare workers should check their skin integrity, visually and with the use of an alcohol based water-free skin cleanser, prior to each shift and cover cuts and abrasions on exposed skin with a water-resistant occlusive dressing. The dressing used should be changed as necessary or when it becomes soiled, loose, damp or damaged.

In situations where non-intact skin cannot be covered by either a dressing or gloves, temporary redeployment of staff involved in direct patient care may be necessary based on the advice of the employee's medical practitioner, staff health or infection control service.

To support hand care, liquid soap and skin cleaning solutions should be pH friendly to skin (pH 5.5–7). This will assist reduction in damage to the natural acid mantle covering the skin surface and reduce damage caused by drying of the skin that is repeatedly cleaned.

Hands can be protected from chafing by the regular use of non-oil based moisturising cream or lotion. Compatibility between the lotion or cream and antimicrobial products, and gloves, should be considered. A pump pack should be used for dispensing moisturising creams or lotions. If a cream or lotion cannot be dispensed by a measured dose, pump dispensing system, then single use applicators or single use spatulas should be used. Alternatively, the moisturising cream or lotion must be allocated as a single person use product.

2.1.1.7 **Hand accessories (artificial fingernails, nail extenders, nail enhancements)**

Healthcare workers involved in direct patient care, sterilizing services and laboratory staff must not wear artificial fingernails, nail extenders or any nail enhancements (eg painting, varnish or nail art). Natural fingernail tips should be less than 0.5cm long.¹⁶

All hand and wrist jewellery must be kept to a minimum during direct patient care. Rings with large or multiple settings or detailed scrollwork must not be worn during direct patient contact. Wrist jewellery must be easily removed for hand hygiene and patient activity, and must not be worn for invasive procedures. Wristbands that cannot be easily cleaned, removed before patient procedures, or before performing hand hygiene (eg those made of cloth, wood or leather) must not be worn in the clinical environment.

The Australian College of Operating Room Nurses (ACORN), *Standards for Perioperative Nursing on Surgical Scrubbing*,²³ provides appropriate guidance for the criteria on wearing jewellery prior to commencing the surgical hand scrub.

2.1.1.8 **Promoting patient and visitor hand hygiene**

All patients must be provided with the means to perform hand hygiene.

Ref ID: PD2010-058

Patients should be encouraged to perform hand hygiene before eating, after going to the toilet or using a bedpan or urinal, after smoking, whenever hands are visibly soiled, after sneezing/coughing into hands, and after touching animals.

Visitors should be encouraged to perform hand hygiene on entering and leaving a ward, after smoking, after sneezing/coughing into hands, and as appropriate before and after lending assistance with their relative or friend who is a patient.

2.1.2 Gloves

This section should be read in conjunction with:

- AS/NZS 4179: *Single-Use Sterile Surgical Rubber Gloves – Specifications*
- AS/NZS 4011: *Single-Use Examination Gloves – Specifications*.

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.

Gloves must be worn on both hands and must be used in situations where the healthcare worker is potentially exposed to blood and/or body substances, in particular:

- during any procedure where direct contact is anticipated with a patient’s blood or body substances, mucous membranes or non-intact skin
- while handling items or surfaces that have come into contact with blood or body substances
- while performing an invasive procedure, venepuncture or a finger or heel stick
- during contact precautions.

2.1.2.1 **Subcutaneous, intramuscular or intradermal injection and glove use**

Gloves need not be worn for subcutaneous, intramuscular or intradermal injection unless exposure to blood is anticipated.

2.1.2.2 **Glove selection and types**

The type of glove selected should be appropriate to the type and risk of the procedure and of a suitable size for the user.

Sterile gloves

Sterile gloves that meet the AS/NZS 4179 must be worn if the procedure involves contact with tissue that would be sterile under normal circumstances.

Medical examination gloves

Medical examination gloves that meet the AS/NZS 4011 must be used for all procedures (except sterile procedures) that involve direct or perceived contact with non-intact skin, mucous membranes and blood or body substances.

General purpose gloves

For housekeeping activities and instrument cleaning and processing, general-purpose household gloves are appropriate. These gloves should be allocated to the individual healthcare worker and can be washed and reused by them. The gloves must be dry inside and outside before reuse and must be discarded when they become peeled, cracked, discoloured, torn or punctured.

Seamed plastic/vinyl gloves

Seamed plastic or vinyl gloves must only be used in food preparation areas.

2.1.2.3 **Changing and discarding gloves**¹³

Gloves must be changed and discarded:

- as soon as they are torn or punctured or when the integrity has been altered
- after contact with a patient is complete and before care is provided 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
- before writing in the medical notes, answering the telephone, using the computer and moving or touching equipment.

Hand hygiene is performed immediately after removing gloves to avoid transfer of micro-organisms to other persons or environments. Disposable gloves must never be reused.

2.1.2.4 **Perioperative glove use**

All staff involved in operating theatre surgical procedures should wear two pairs of gloves (ie double glove).²⁴ In the event of any tear, puncture or needlestick injury the gloves must be removed as soon as it is safe to do so, and hands washed prior to donning new sterile gloves. If a sharp or instrument is involved in the incident it should be removed from the sterile field immediately.

2.1.3 Facial protection

This section should be read in conjunction with:

- AS/NZS 4381: *Single use face masks for use in healthcare*
- AS/NNZS 1336: *Recommended practices for occupational eye protection*
- AS/NZS 1337: *Eye protectors for industrial application.*

2.1.3.1 Mask^{13,25,26,27}

As part of standard precautions a fluid-resistant mask or face shield must be worn while performing any procedure where there is a likelihood of splashing or splattering of blood or body substances.

A fluid resistant surgical mask must be worn in surgery or for invasive and dental procedures, to prevent blood or body substance splashes. A mask must:

- be worn and fitted in accordance with the manufacturer's instructions
- not be touched by hands while worn
- cover both the mouth and nose while worn
- not be worn loosely or folded down around the neck.

A mask must be discarded once it has been worn, or becomes visibly soiled or moist, and must not be used again. When the mask becomes moist from the wearer, or from contamination, the barrier has been breached and the mask is no longer effective. A mask must be removed by touching the strings/ties or loops only.

2.1.3.2 Protective eyewear¹³ (goggles, face visors/shields)

As part of standard precautions, protective eyewear or a face visor/shield must be worn while performing any procedure where there is a risk of splashing or splattering of blood or body substances.

Eyewear must be optically clear, anti fog, distortion free, close fitting, shielded at the side and conform to AS/NZS 1336 and AS/NZS 1337. Protective eyewear must be worn and fitted in accordance with the manufacturer's instructions.

General prescription glasses do not comply with these standards and, therefore protective eyewear must be worn in addition to prescription glasses if there is a likelihood of being splashed with blood or body substances, and for implementation of droplet precautions.

Reusable protective eyewear and face visors/shields must be cleaned in accordance with the manufacturer's instructions after use and stored clean and dry.

Protective eyewear labelled single use must not be reused.

2.1.4 Gown/apron

A fluid-resistant gown or apron made of impervious material provides a barrier to reduce opportunities for transmission of pathogens in healthcare settings.

A fluid-resistant gown or apron made of impervious material must be worn:

- during any procedure where there is a likelihood of splashes or contamination with blood or other body substances¹³
- on entering an isolation room during contact precautions, if contact with the patient or the patient's environment is likely, and removed before or immediately on exiting the room. The gown/apron is then disposed into the general waste, providing it is not contaminated with blood or body substances
- as a protective layer under a sterile gown that is not made of impervious material, when there is the chance of splash or splatter
- underneath a sterile cloth gown when performing invasive procedures, especially if it involves the likelihood of splashes or contamination with blood or other body substances.

Perioperative attire should not be worn outside of the perioperative environment with exception of emergency attendance of patients. An outer gown should cover the front of the attire when leaving the perioperative environment.

2.1.5 Donning and removing personal protective equipment

The recommended practice for donning and removing PPE, to prevent skin or clothing contamination should be in the following sequence.* This sequence will be dependant on the physical layout of the isolation room in relation to corridors and anterooms.

The P2 mask (for airborne precautions) should be removed outside the room, after the door has been closed. Ensure that hand hygiene facilities or alcohol based water-free skin cleansers are available at the point needed.

Donning PPE

- perform hand hygiene
- gown/apron
- mask
- protective eyewear/visor
- gloves

Removing PPE

- gloves
- perform hand hygiene
- protective eyewear/visor
- gown/apron
- mask
- perform hand hygiene

*The combination of PPE will affect the sequence. Hand hygiene must be performed if hands become contaminated during any step.

Clothing/uniform contaminated with blood or body substances should be removed as soon as possible, and before the healthcare worker attends other patients.

If skin is contaminated with blood or body substances, the healthcare worker must wash their hands and all affected areas after the removal of their clothing/uniform and/or personal protective equipment. The blood or body substance exposure must be reported in accordance with the health organisation policy.

2.1.6 Appropriate equipment/medical device handling

Used patient care equipment soiled with blood and body substances must be handled in a manner that prevents healthcare worker skin and mucous membrane exposure, contamination of clothing and transfer of micro-organisms to other patients and environments. Reusable equipment must not be used for the care of another patient until it has been appropriately cleaned and/or reprocessed. Single use items must be discarded after use.

2.1.7 Appropriate handling of laundry

Linen soiled with blood, body substances, secretions, and excretions must be handled, transported and processed in a manner that prevents skin and mucous membrane exposures, contamination of clothing, and transfer of micro-organisms to healthcare workers, other patients and associated environments.

2.1.8 Respiratory hygiene/cough etiquette

All people with signs or symptoms of a respiratory infection, regardless of presumed cause, should be instructed to:

- cover the nose/mouth when coughing or sneezing with a tissue
- use tissues to contain respiratory secretions
- spit into tissue, if spitting is necessary
- dispose of tissues in the nearest rubbish bin after use

- perform hand hygiene after contact with respiratory secretions and contaminated objects or materials
- wear a surgical mask (if coughing or sneezing, when being transported, or to protect other persons in a common waiting area).

Health organisations must:

- ensure the availability of materials for adhering to respiratory hygiene/cough etiquette in waiting areas for patients and visitors
- erect signs with instructions to patients and visitors on respiratory hygiene/cough etiquette
- offer surgical masks to persons who are coughing in common waiting areas
- encourage coughing persons to sit at least 1 metre away from others in common waiting areas
- reinforce the importance of hand washing and provide access to hand hygiene amenities
- ensure that healthcare workers have access to appropriate PPE, and provide specific training in the use of the PPE
- develop a risk assessment program for coughing healthcare workers, particularly those working in areas with vulnerable patients, such as neonatal intensive care units and paediatrics
- develop a protocol that minimises the risk of airborne and droplet transmission of transmissible diseases in the healthcare setting. The protocol must address:
 - early detection of transmissible diseases in healthcare workers
 - human resource issues, such as redeployment or sick leave
 - immunisation assessment, screening and vaccination
 - infection control precautions
 - compliance with OH&S and related policy directives.

Healthcare workers must:

- be medically assessed by their doctor if they have a persistent cough and practice respiratory hygiene/cough etiquette
- encourage all persons to perform respiratory hygiene/cough etiquette
- participate in infection control education programs to minimise airborne and droplet transmission of diseases in the healthcare setting
- attend specific training in the use of PPE.

Table 3. Summary of standard precautions

Requirements	Standard precautions
	All persons, blood (<i>including dried blood</i>); all body substances, secretions and excretions (<i>excluding sweat</i>); non-intact skin; and mucous membranes including eyes.
Single room	No
Negative pressure	No
Hand hygiene	Yes
Gloves	Protect hands if anticipated contact with blood and body substances.
Gown/apron	Protect clothing where soiling or splashing is likely.
Mask	Protect face using a surgical mask if splash or aerosol likely.
Protective eyewear	Protect eyes if splash likely or where aerosol may be generated.
Special handling of equipment	Gloves for handling equipment contaminated with blood and body substances. Avoid contaminating environmental surfaces and equipment with used gloves.
Transport of patients	Cover all patient's open wounds. Surgical mask if coughing/sneezing and other signs and symptoms of an infectious transmissible disease spread by airborne or droplet route.
Alert	Respiratory hygiene for coughing and sneezing patients suspected of having an infectious respiratory illness. Exposures to blood/body substance – immediately wash site, promptly notify supervisor and seek management of exposure. Handle needles, syringes and sharps with care. Use approved rigid sharps containers for disposal. DO NOT recap, break or bend needles.
Cleaning	Standard cleaning protocol.

2.2 Additional (transmission based) precautions (Tier 2)

In this policy document Additional (Transmission Based) Precautions will be referred to as **Additional Precautions**. These precautions are designed for patients known or suspected to be infected with pathogens for which additional precautions, in addition to Standard Precautions, are needed to interrupt transmission of those pathogens in health organisations.

There are three types of Additional Precautions:

- Airborne precautions
- Droplet precautions
- Contact precautions.

A combination may be required for diseases that have multiple routes of transmission, or for those diseases where the mode of transmission changes throughout the course of the disease. Additional Precautions are implemented for pathogens spread by airborne or droplet transmission, or direct person contact or contact with contaminated surfaces, or by any combination of these routes.

Health organisations should provide the recommended accommodation for the patient, and must provide PPE and patient care equipment along with training in its use for staff.

Immunocompromised patients vary in their susceptibility to healthcare associated infections, depending on the severity and duration of immunosuppression. These patients generally are at increased risk for bacterial, fungal, parasitic, and viral infections from both endogenous and exogenous sources. The routine use of Additional Precautions for susceptible patients may be recommended.²⁸

It is not possible to identify prospectively all patients for whom Airborne, Droplet, or Contact Precautions are required, however, certain clinical syndromes and conditions are high risk. For example, presumptive/suspected pulmonary tuberculosis may warrant the implementation of Additional Precautions while a definitive diagnosis is pursued.

In some instances, the risk of healthcare associated transmission of infection may be highest before a definitive diagnosis can be made, and before precautions based on that diagnosis could be implemented. Where a patient is known or suspected to be infected with such a pathogen, Additional Precautions should remain in effect until pathology results document absence of the pathogen or until effective treatment has been commenced and continued for the appropriate period of time.

Triaging of patients suspected of a transmissible infection or disease should occur in a manner that prevents contamination of the environment and transmission in waiting rooms. Suspected patients should be moved from public waiting rooms to a single patient accommodation area while awaiting treatment.

Table 4. Summary of airborne precautions

Requirements	Airborne precautions
Single room	Yes Door closed. It is recommended that single patient rooms be fitted with ensuite facilities. In the advent of no ensuite facilities, a toilet and bathroom should be dedicated for individual patient use.
Negative pressure*	Yes, if available otherwise single room with door closed and window open.
Hand hygiene	Yes
Gloves	Standard Precautions
Gown/apron	Standard Precautions
Mask	Yes, P2 Mask (perform fit check prior to entering room) Remove mask after leaving patient room.
Protective eyewear	Standard Precautions
Special handling of equipment	Standard Precautions Avoid contaminating environmental surfaces and equipment with used gloves.
Transport of patients	Surgical mask for patient when they leave the room ^{28,29} 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). Advise transport staff of level of precautions to be maintained. Surgical mask if coughing/sneezing and other signs and symptoms of an infectious transmissible disease spread by airborne or droplet route. Notify area receiving patient.
Alert	Visitors to patient room must also wear P2 mask and perform hand hygiene. Patient Medical Records must not be taken into the room. Signage of room.
Room cleaning	Standard cleaning protocol. May require additional cleaning with a disinfectant agent depending on organism. Consult with infection control professional.

2.2.1 Airborne precautions

Airborne Precautions apply to patients known or suspected to be infected with pathogens that can be transmitted by the airborne route and are designed to reduce the risk of airborne transmission of infectious agents.

Airborne transmission occurs by dissemination of either airborne droplet nuclei (small-particle residue [5µm or smaller in size] of evaporated droplets that may remain suspended in the air for long periods of time) or dust particles containing the infectious agent.

Patients for whom airborne precautions are required should be cared for in a negative pressure room.

2.2.2 Droplet precautions

Droplet Precautions apply to any patient known to be or suspected of being infected with pathogens that can be transmitted by the droplet route and are designed to reduce the risk of droplet transmission of infectious agents.

Respiratory droplets are generated when a patient coughs, sneezes, talks or during procedures such as

suctioning and chest physiotherapy. Transmission via large-particle droplets (larger than 5µm in size) requires close contact between source and recipient persons, because droplets do not remain suspended in the air and generally travel only short distances, usually one metre or less, through the air. Droplet transmission involves contact of the conjunctivae or the mucous membranes, of the nose or mouth, of a susceptible person

Because droplets do not remain suspended in the air, special air handling and ventilation are not required to prevent droplet transmission.

Patient placement for droplet precautions:

- place the patient in a private (isolation) room; or
- when a private room is not available, cohort a patient in a room with a patient(s) who have active infection with the same microorganism but with no other infection; or
- when a private room is not available and cohorting is not achievable, maintain spatial separation of at least one metre between the infected patient and other patients and visitors.⁸¹

Table 5. Summary of droplet precautions

Requirements	Droplet precautions
Single room	Yes, or Cohort with patient with same pathogen (in consultation with infection control professional, or infectious diseases physician), or Maintain spatial separation of at least one metre It is recommended that single patient rooms be fitted with ensuite facilities. In the advent of no ensuite facilities, a toilet and bathroom should be dedicated for individual or cohort patient use.
Negative pressure	No
Hand hygiene	Yes
Gloves	Standard Precautions
Gown/apron	Standard Precautions
Mask	Yes Surgical mask. Remove mask after leaving patients room.
Protective eyewear	Yes
Special handling of equipment	Standard Precautions
Transport of patients	Surgical mask if coughing/sneezing and other signs and symptoms of an infectious transmissible disease spread by airborne or droplet route. Surgical mask for patient when they leave the room. 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). Advise transport staff of level of precautions to be maintained. Notify area receiving the patient.
Alert	When cohorting patients, they require minimum of one metre of patient separation. Visitors to patient room must wear a fluid resistant surgical mask and protective eyewear (if unable to maintain 1 metre distance) and perform hand hygiene. Patient Medical Records must not be taken into the room. Signage of room.
Room cleaning	Standard cleaning protocol. May require additional cleaning with a disinfectant agent depending on organism. Consult with infection control professional.

2.2.3 Contact precautions

Contact Precautions are designed to reduce the risk of transmission of micro-organisms by direct and/or indirect contact.

Transmission of micro-organisms by the contact route is the most common mode for healthcare associated infections. Transmission may occur via direct contact or indirect contact.^{13,16,28}

Direct contact transmission

Involves skin-to-skin contact and physical transfer of micro-organisms directly from one person to another person, such as when healthcare workers reposition, bathe or perform other patient care activities that require physical contact. Direct contact transmission can also occur between two patients (eg by hand

contact), with one serving as the source of infectious micro-organisms and the other as a susceptible host.

Indirect contact transmission

Involves transfer of an infectious agent through a contaminated intermediate object or person. Hands of healthcare personnel are usually cited as the most important contributors to indirect contact transmission,¹³ via the environment and fomites (eg stethoscopes). Patient care devices, instruments and equipment that are inadequately reprocessed between patients can transmit pathogens.

Table 6. Summary of contact precautions

Requirements	Contact precautions
Single room	Yes, or Cohort with patient with same pathogen (in consultation with infection control professional or infectious diseases physician).
Negative pressure	No
Hand hygiene	Yes
Gloves	Yes, If there is direct contact with the patient or their environment.
Gown/apron	Yes, If there is direct contact with the patient or their environment.
Mask	Standard Precautions
Protective eyewear	Standard Precautions
Special handling of equipment	Single use or if reusable, reprocess before next patient. Avoid contaminating environmental surfaces and equipment with used gloves.
Transport of patients	Surgical mask if coughing/sneezing and other signs and symptoms of an infectious transmissible disease spread by airborne or droplet route. Notify the area receiving patient. Advise transport staff of level of precautions to be maintained.
Alert	Remove gloves and gown/apron and perform hand hygiene on leaving the room. Patient Medical Records must not be taken into the room. Signage of room.
Room cleaning	Standard cleaning protocol. May require additional cleaning with a disinfectant agent depending on organism. Consult with infection control professional.

2.2.4 Masks and protective eyewear for additional precautions

This section should be read in conjunction with:

- AS/NZS 1715: *Selection, use and maintenance of respiratory protection devices*
- AS/NZS 1716: *Respiratory protective devices.*

Surgical mask for patient use

A patient is required to wear a surgical mask when there is a risk of airborne or droplet transmission to other patients, visitors or healthcare workers.

When patients requiring droplet or airborne precautions are receiving oxygen therapy, nasal prongs should be used and a surgical mask should be worn over the top of the nasal prongs for transport (if medical condition allows).

Patients with respiratory illnesses who are coughing, and who are attending outpatient or emergency departments, need to be assessed to determine whether they require a surgical mask.

Surgical mask for visitor use

Visitors to a patient who has a disease spread by droplet transmission who cannot maintain at least a one-metre distance must wear a fluid repellent surgical mask (and protective eyewear or visor).

Surgical mask for healthcare worker use

Healthcare workers who attend a patient with a disease spread by droplet transmission, or a coughing respiratory illness, and who cannot maintain at least one metre distance must wear a fluid repellent surgical mask (and protective eyewear or visor).

P2 mask

A particulate filter personal respiratory protection device or P2 mask is a close fitting mask worn for Airborne Precautions, which is capable of filtering 0.3µm particles. A P2 mask must comply with AS/NZS 1716.

Fit checking

Healthcare workers must perform fit checks every time they don a P2 mask. No clinical activity should be undertaken until a satisfactory fit has been achieved.

Fit checks ensure the mask is sealed over the bridge of the nose and mouth and that there are no gaps between the mask and face.

Healthcare workers must be informed on how to perform a fit check. The procedure for fit checking includes:

- placement of the mask on the face
- placement of the headband or ties over the head and at the base of the neck
- compressing the mask to ensure a seal across the bridge of the nose
- compressing the mask to ensure a seal across the cheeks and face
- checking the positive pressure seal of the mask by gently exhaling. If air escapes the mask needs to be adjusted
- checking 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.

The manufacturer's instructions for fit checking of individual brands and types of P2 masks should be referred to at all times.

Healthcare workers who have facial hair (including a 1–2 day beard growth) must be made aware that an adequate seal cannot be guaranteed between the P2 mask and the wearer's face.

Fit testing

The purpose of fit testing is to identify which size and style of P2 mask is suitable for an individual, and to ensure that it is worn correctly. It also provides an opportunity to ensure healthcare workers are properly trained in the correct use of the mask. A separate policy on fit testing will address the requirements for health organisations.

Powered air-purifying respirator (PAPR)

Powered air-purifying respirator (PAPR) devices should conform to AS/NZS 1715 and AS/ANZS 1716, and must only be used by healthcare workers who are trained in their use. The manufacturer's instructions for cleaning, decontaminating and maintenance must be followed.

PAPR may be suitable for healthcare workers with facial hair and those who fail fit testing for P2 masks.

Protective eyewear (goggles, face visors/shields)

Protective eyewear is required for droplet precautions to reduce the risk of transmission of infectious agents. The eyewear must conform to AS/NZS 1715 and AS/ANZS 1716 and as outlined in section 2.1.3.2 of this document.

Safe handling, use and disposal of sharps

This section should be read in conjunction with:

- AS/NZS 3825: *Procedures and devices for the removal and disposal of scalpel blades from scalpel handles*
- AS/NZS 4261: *Reusable Containers for the Collection of Sharp Items Used in Human and Animal Medical Applications*
- AS 4031: *Non-Reusable Containers for the Collection of Sharp Medical Items Used in HealthCare Areas*
- AS/NZS 3816: *Management of clinical and related wastes*
- PD2005_132 *Waste Management Guidelines for HealthCare Facilities*
- *Occupational Health and Safety Act 2000.*

A sharp is any object capable of inflicting a penetrating injury. This includes needles, broken glass, broken capillary tubes and any other sharp objects or instruments designed to perform penetrating procedures.³⁰

The potential for transmission of blood borne viruses is greatest when medical devices, such as needles, scalpels, and other sharp instruments are used.¹³ Wherever possible, the use of sharps should be minimised.

3.1 Responsibility for sharps

Health organisations must have written policies for the safe handling and disposal of sharps and should ensure training is provided annually to healthcare workers in sharps handling and disposal. Each healthcare worker is responsible for the management and safe disposal of any sharp they use.

3.2 Safe practices when using a sharp

3.2.1 Non-reusable sharps

Non-reusable sharps must:

- be safely managed
- not be re-sheathed
- be disposed of in a puncture resistant container immediately or as soon as practical following use.

3.2.2 Reusable sharps^{13,30,31,32,33}

Health organisations that reprocess reusable sharps must have safe handling policies and procedures in place for transportation and reprocessing.

After use, reusable sharps must be placed immediately into a puncture-resistant container kept especially for that purpose and labelled as such.

When more than one reusable sharp is held in the puncture-resistant container, special care should be taken to prevent injury during placement of sharps into that container, and during their removal prior to reprocessing.

3.2.3 Transferring a sharp^{13,31,32}

A sharp must not be passed by hand between either healthcare workers or a healthcare worker and any other person. During procedures a puncture resistant tray must be used to transfer sharps from one healthcare worker to another healthcare worker. However, this requirement does not apply if, in any case involving an invasive procedure, the proper conduct of the procedure would be adversely affected.

3.2.4 Re-sheathing a needle³¹

Needles must not be re-sheathed, except in special circumstances such as dental practice. If re-sheathing is required in these special circumstances:

- the needle must be properly recapped
- the sheath must not be held in the fingers
- either a single-handed technique, forceps, or a suitable protective guard designed for re-sheathing must be used.

3.2.5 Manipulation of a needle^{31,33,34,35}

A needle must not be removed from a disposable syringe for disposal, or be purposely broken or otherwise manipulated by hand, unless it is necessary to remove the needle for technical reasons or the practitioner is performing a procedure in which the needle is required to be bent in order to perform that procedure.

In the event the practitioner is performing a procedure in which the needle is required to be bent, a suitable pair of forceps should be used to manipulate the needle.

A needle must not be bent after it is contaminated with blood or body substances.

3.2.6 Removing a scalpel blade from scalpel handle³³

AS/NZS 3825 should be followed for the removal and disposal of scalpel blades and other similar devices.

3.3 Sharps containers

All sharps containers must:

- comply with AS/NZS 4261 and AS 4031
- be puncture-resistant, waterproof and leak-proof
- have an opening that is wide enough to allow sharps to be dropped into the container by a single hand operation or from a puncture resistant container used for transporting sharps for disposal
- be clearly labelled with black lettering on yellow background with the "biohazard" symbol printed on the container
- remain upright at all times
- never be overfilled (change container when three quarters full, or contents to fill line)
- be securely sealed with a lid before disposal.

In addition, reusable sharps containers must be:

- cleaned and disinfected before reuse
- inspected before reuse to ascertain that they are clean, intact and without leaks

- repaired before use or taken out of service, if found to be defective
- resistant to leakage, impact rupture and corrosion.

Sharps containers must be placed as close as practical to the immediate area where sharps are used (known as 'point of use') to limit the distance between the area of use and disposal. If it is determined that point of use sharps containers are unable to be made available for specific procedures or settings, rigid containers (eg injection trays) that are puncture resistant and comply with Australian Standards (AS) are to be used.

Sharps containers should be mounted at an ergonomic and occupationally safe position and height to suit the staff required to utilise them. Sharps containers must also be placed so visitors, particularly children, cannot easily access them, eg containers should not be placed on floors, or on the lower shelves of trolleys in areas where children might gain access.

Containers must be of a large enough size to accommodate the type of devices commonly used in the clinical area where they are situated. Sharps must never be forced into a sharps container.³⁰

3.4 Needlestick injuries or exposures to blood and/or body fluids

Needlestick injuries or exposures to blood and/or body fluids must be reported in accordance with the health organisation policy and should be managed as outlined in PD2005_311 *Management of HealthCare Workers Potentially Exposed to HIV, Hepatitis B and Hepatitis C*.

Reprocessing of reusable medical instruments and equipment

This section should be read in conjunction with the following documents:

- AS/NZS 4187: *Cleaning, Disinfecting and Sterilizing Reusable Medical and Surgical Instruments and Equipment, and Maintenance of Associated Environments in HealthCare Facilities*
- AS/NZS 4815: Office-based healthcare facilities. Reprocessing of reusable medical and surgical instruments and equipment, and maintenance of the associated environment
- AS 2182: *Sterilizer Steam Benchtop*
- NSW Health, Health Procurement, *Guidelines for Storage and Handling of Pre-Sterilized Consumables*
- AS 2487: *Dry heat sterilizers*.

The Australian Government Therapeutic Goods Administration (TGA) via the *Therapeutic Goods Act* regulates sterilants, disinfectants and benchtop/portable sterilizers.^{36,37}

Each health organisation must have written protocols on the reprocessing of reusable medical instruments and equipment to ensure that correct procedures are conducted and that handling, packaging and storing techniques prevent contamination of the item. In addition, written protocols must be developed by health organisations regarding the handling, packaging and storage of commercially prepared sterile items.

4.1 The Australian register of therapeutic goods

Only disinfectants and sterilants specified in the Australian Register of Therapeutic Goods (ARTG) may be used by healthcare workers for disinfection and sterilization. The disinfectant or sterilant must only be used for the approved purpose.

Although sponsors (supplier) of disinfectants or sterilants are not required to document a product's listing on the ARTG on the product label, the TGA issue a "listing certificate" or "registration certificate" to sponsors.

These certificates are valid unless they are:

- cancelled by the sponsor advising the TGA that they are no longer able to supply the listed disinfectants or sterilants; or
- cancelled by the Secretary of the Australian Government Department of Health and Ageing.

Healthcare workers involved in the purchase or use of disinfectants or sterilants, must, prior to purchase, seek a copy of the TGA "listing certificate" or "registration certificate" from the sponsor.

4.2 Categorisation of reusable instruments and equipment

Reusable instruments and equipment are divided into three categories, based on the degree of risk of infection associated with their use. Examples are provided in Table 7 (this list is not exhaustive).

4.3 Reprocessing of reusable instruments and equipment

Reprocessing is all steps necessary to make a contaminated reusable medical device ready for its intended use.

The steps include cleaning, functional testing, inspecting, packaging, labelling and disinfection or sterilization.

The reprocessing indicated for an item depends on its intended use. Any micro-organisms, including bacterial spores, that come in contact with normally sterile tissue can potentially cause infection. These must be eliminated from items intended for use in sterile sites by cleaning and sterilization.

Manufacturer's instructions must be followed when reprocessing reusable instruments and equipment, unless those instructions contravene current Australian New Zealand Standards and NSW Health policy. If the manufacturer's instructions contravene AS/NZS 4187, a written report must be sent to the manufacturer and to TGA via the Incident Report Investigation Scheme – IRIS, online: http://www.tga.gov.au/docs/pdf/forms/iris_udir02.pdf.

Table 7. Level of reprocessing required for specific items and procedures

Category	Processing	Application	Examples of items
Critical	Sterilization	Instruments and equipment that enter, or are capable of entering, tissue that would be sterile under normal circumstances or the vascular system.	Instruments and equipment covered by this category include surgical instruments, diagnostic and interventional radiology catheters, cystoscopes, arthroscopes, biopsy forceps, bronchoscopes*, cannula, cardiac catheters, aortic ultrasound probes, gamma radiation probes, implants, dental hand pieces, duodenoscopes, ERCP scope, ultrasonic scalers and laryngoscope blades#.
Semi-critical	Disinfection	Instruments and equipment that come into contact with non-sterile tissue (other than intact skin) and mucous membranes.	Instruments and equipment covered by this category include one-way breathing valves, pneumotachograph screens, mouth shutters, respiratory therapy equipment, prosthetic dental appliances and impressions, vaginal ultrasound transducers, colonoscopes, gastroscopes, nasoendoscopes and specula.
Non-critical	Cleaning	Instruments and equipment that come into contact with intact skin.	Instruments and equipment covered by this category include, bedpans, EEG and ECG leads, beds and stethoscopes.

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

#Laryngoscope blades must be sterilized between patients but do not need to be stored in a sterile state however, they must be stored in a dry, clean state and be covered.

Reprocessing requirements must be considered before purchasing equipment to ensure it can be appropriately reprocessed to the level required.

Healthcare workers whose primary role is the reprocessing of reusable instruments and equipment should receive formal training at a registered training organisation in the cleaning, disinfection and sterilization of instruments and equipment.^{7,38}

4.4 Cleaning of reusable instruments and equipment

Any reusable instrument or equipment that comes into contact with intact skin must be cleaned before it is used. The process of cleaning must involve water and physical or mechanical action combined with a cleaning agent such as a detergent or proteolytic enzyme, that has been selected as suitable for the task.

The cleaning area must be dedicated for that purpose only. Reusable instruments that are washed manually should be rinsed and cleaned in a sink or bowl specifically designed for that purpose. All cleaning agents must be removed from instruments and equipment by a thorough rinsing process before reuse or prior to further reprocessing.

Reusable instruments and equipment must be inspected to establish that they are visibly clean, intact and working before further reprocessing or storage.

Cleaning brushes, dedicated for this purpose, must be washed, thermally disinfected, and stored dry at the end of each day.

Personal protective equipment such as general purpose rubber gloves, fluid resistant mask and eye protection or face shield and fluid resistant gowns must be worn by healthcare workers when cleaning and reprocessing equipment and instruments to protect against splashing, spraying or aerosol.

4.5 Disinfection of reusable instruments and equipment

All reusable instruments or equipment that comes into contact with non-sterile tissue (other than intact skin) must be cleaned and disinfected before it is used. Cleaning must always precede disinfection.

Items that are not contained by packaging following reprocessing, such as semi critical items, are at risk of being contaminated if not used immediately following disinfection.

Items must not be stored by soaking in disinfectants as they may become contaminated or may degrade over time. The manufacturer's instructions must be checked for compatibility of the instrument or equipment with the method of disinfection to be used.

Disinfection must be achieved by either thermal or chemical methods. Thermal disinfection must be used in preference to chemical disinfection. Chemical disinfection may only be used for items for which thermal disinfection methods are unsuitable.

4.5.1 Thermal disinfection

Where thermal disinfection is used, all parts of the item must be subjected to moist heat at or above the recommended temperature for the recommended duration.

The minimum surface temperature/time relationship for thermal disinfection is as follows:^{7,39}

Table 8. Minimum surface temperature/time relationship for thermal disinfection

Surface temperature °C	Minimum disinfection time (minutes)
90	1
80	10
75	30
70	100

The combinations have been calculated and predicted from known thermal inactivation kinetics of vegetative micro-organisms subjected to thermal disinfection.⁷

4.5.2 Chemical disinfection

Where chemical disinfectants are used, only those specified in the ARTG may be used, and the relevant manufacturer's instructions must be followed.

All parts of the item must be exposed to the chemical disinfectant for the time specified.

4.5.3 Automated washer/disinfector

AS/NZS 2945: *Batch-type washer/disinfector for healthcare facilities*, and the manufacturer's instructions must be followed.

Non-critical items and semi-critical items should not be reprocessed during the same cycle of the automated washer/disinfector machine.

4.6 Sterilization of reusable instruments and equipment

Any reusable instrument or equipment used to enter, or that is capable of entering tissue that would be sterile under normal circumstances, or the vascular system, must be cleaned and sterilized before it is used. Cleaning must always precede sterilization.

Sterilization must be consistent with AS/NZS 4187, AS/NZS 4815 and AS/NZS 2182.

The method of sterilization must be compatible with the type of instrument or equipment. The manufacturer's instructions must be checked for compatibility of the instrument or equipment with the method of sterilization.

If a sterilizer is used (whether it is a benchtop/portable sterilizer or a permanently plumbed or wired sterilizer) the following criteria must be met:

- the relevant manufacturer's instructions must be followed
- an ongoing monitoring program which reflects the requirements of AS/NZS 4187, AS/NZS 4815 and AS/NZS 2182 must be followed.

Microwave ovens, pressure cookers, dishwashers, ultraviolet cabinets, ultrasonic cleaners and similar devices do not sterilize and therefore must not be used for the purpose of sterilization.⁷

Unless the instrument or equipment has been sterilized by the wrapped method, and stored in a manner that maintains sterility, it cannot be considered sterile unless it is used immediately. The wrapped method is the preferred method of sterilizing if items are validated and compatible with that method.

All packaged and wrapped sterile instruments and equipment must be transported, stored and handled in a manner that maintains the integrity of packs and prevents contamination from any source. If a sterile item is suspected of being unsterile (eg damaged packaging) the item must not be used.

Packaging materials must be compatible with the sterilising method used in order to provide an effective barrier against sources of potential contamination and allow aseptic removal of the items.

Manufacturer's instructions for effective and safe use of the sterilizer must be followed. Sterilization must be achieved by using one of the following methods:

4.6.1 Steam under pressure (moist heat) sterilization⁷

The recommended temperature/pressure/holding time must be reached when reprocessing items via this method. Penetration time must be established and added to the times listed below.

Table 9. Recommended temperature/pressure/holding times

°C	Kpa	Psi	Holding time plus safety factor (minutes)
121	103	15	15
126	138	20	10
132	186	27	4
134	203	30	3

4.6.2 Dry heat sterilization⁷

Instruments and equipment must be maintained in a dry air oven (dry heat sterilizer – hot air type) at 160°C for a minimum one-hour holding time.

4.6.3 Low temperature hydrogen peroxide plasma sterilization⁷

Low temperature hydrogen peroxide plasma is used to achieve low temperature/low moisture sterilization within a cycle specified by the relevant manufacturer.

4.6.4 Low temperature peracetic acid⁷

Moist low temperature peracetic acid is used to achieve low temperature sterilization in an environmentally sealed chamber within a cycle specified by the relevant manufacturer.

Items that have been sterilized by low temperature peracetic acid are at risk of contamination if not used immediately after sterilization.

4.6.5 Ethylene oxide⁷

Ethylene oxide is used to sterilize heat sensitive and moisture sensitive items, which cannot withstand temperatures greater than 60°C.

4.7 Emergency ‘flash’ sterilization⁷

Emergency ‘flash’ sterilizers are designed for one-off single instrument sterilization, eg when an instrument has been inadvertently left out of a set or dropped and there is no wrapped, sterile replacement available. Emergency ‘flash’ sterilization must be restricted to this situation and can only be used for unwrapped non-porous items.

The instrument emergency ‘flash’ sterilizer cycle performance must be validated, monitored and documented in accordance with AS/NZS 4187. Protocols must be in place to ensure that there is compliance with the use of emergency ‘flash’ sterilizers.

Due to the difficulty of air removal, the efficiency of reprocessing large volumes of instruments at one time cannot be established. Therefore, emergency ‘flash’ sterilizers must not be used for such purposes.

Emergency ‘flash’ sterilization should never be used for reasons of convenience such as either an alternative to purchasing additional instrument sets or as a general time-saver.

Cannulated, complex instrumentation including power tools and tubing must not be reprocessed by this method. Instruments must be compatible with and validated for this method, and must be cleaned before emergency ‘flash’ sterilization.⁷

Items that have been through the emergency ‘flash’ sterilizer are at risk of contamination if not used immediately after sterilization.

Specifically designed containers for use in emergency ‘flash’ sterilizers and for transporting emergency ‘flash’ sterilized instruments must be validated for the sterilizer in which they are to be used.

Surgical facemasks and sterile attire must be worn to transfer items from the emergency ‘flash’ sterilizer to the point of use.

Instruments that have been through the emergency ‘flash’ sterilizer during a surgical procedure must be tracked to the sterilizer used. Information required for an emergency ‘flash’ sterilized instrument is:

- identification of the person who loaded the sterilizer
- name of the instrument
- date and time
- patient details
- name of the person releasing the item for use.

Documentation must be maintained for the unloading of the emergency ‘flash’ sterilizer. In addition a notation that an emergency ‘flash’ sterilized item was used during the procedure must be made in the patient’s medical records.

4.8 Storage of sterilized instruments and equipment^{7,8,38}

Sterilized items must be stored and handled in a manner that maintains the integrity of the packaging material, and prevents contamination of the contents.

Sterilized items must be stored so that packaging is not crushed, bent, compressed, punctured, exposed to heat or direct sunlight and free of vermin and insects^{13,38,40} or held together with elastic bands, staples or paper clips. The contents of any sterilized package must be considered contaminated if the packaging is either damaged or becomes wet.

Sterile storage areas must be:

- dedicated for the purpose
- cleaned to a routine schedule
- free from dust, insects and vermin.

Sterile items on open shelving must be stored:

- at least 250mm off the floor
- at least 440mm from the ceiling
- out of direct sunlight.

4.8.1 Shelf life and rotation of stock

Factors which influence shelf life are event-related and include:

- package design
- packaging material
- storage and handling conditions.

A stock rotation policy and procedure should be developed for all areas of the health organisation in which sterile supplies are stored.

Stock levels must be maintained at an appropriate level for the clinical area.

4.9 Documentation

Documentation must be maintained for all reprocessing of reusable instruments and equipment and for the sterilizer in accordance with AS/NZS 4187.

4.10 Tracking system

Area Health Services should consider introducing a tracking system for high-risk instruments and equipment that is suitable for each of their health

organisations. High-risk instruments and equipment include those that come into contact with high-risk tissue for Creutzfeldt-Jakob Disease (CJD) such as brain, dura mater, spinal cord, dorsal root ganglia, trigeminal ganglia, olfactory epithelium, posterior chamber of the eye and the retina.

Dedicated instrument trays should be maintained for surgical procedures where the risk of exposure to CJD is high, eg neuro-shunt trays and retina trays. Instruments in these trays should be permanently assigned and should not be inter-dispersed into other general surgical trays.

4.11 Reusable instruments and equipment that require special reprocessing

This section should be read in conjunction with:

- AS/NZS 4187: *Cleaning, Disinfecting and Sterilizing Reusable Medical and Surgical Instruments and Equipment, and Maintenance of Associated Environments in HealthCare Facilities*
- SNZ HB 8149: 2001:S New Zealand Handbook – *Microbiological Surveillance of Flexible Hollow Endoscopes*.

4.11.1 Endoscopy^{7,39,41,42,43}

Endoscopes and accessory equipment must be validated, monitored, documented, handled, reprocessed and stored in accordance with AS/NZS 4187.

Endoscopes must be manually cleaned after each use,⁷ including all channels identified by the manufacturer, and before being reprocessed in an automated endoscope washer disinfectant or by a sterilization method.

Accessory equipment such as biopsy forceps, which enter or are capable of entering tissue that would be sterile under normal circumstances, must be cleaned and sterilized before use. Endoscope cleaning brushes and accessory cleaning equipment must be cleaned and sterilized after each use and stored dry.⁷

Healthcare workers involved in the cleaning and reprocessing of endoscopes must be trained in the principles of cleaning and, where appropriate, in the operation and the limitations of an automated endoscope washer disinfectant.

Where an automated washer disinfectant is used, there must be a preventative maintenance plan for it. The plan

Table 10. Recommended process for investigating a positive microbiological result of an endoscope

Microbiological sample	Investigation	Action
One or two micro-organisms repeatedly isolated from the same endoscope.	Consider an internal endoscope fault.	Contact manufacturer to discuss and if advised send for repair.
One micro-organism repeatedly isolated from two or more endoscopes.	a) Consider poor collection technique if coagulase-negative staphylococci, staphylococcus aureus, micrococci, diphtheroids or Bacillus species isolated.	Review collection method and compliance
	b) Consider the automated disinfecting machine or water contamination if a non-tuberculous mycobacterium or environmental gram-negative bacillus is isolated.	Stop using the implicated disinfecting machine. Investigate the disinfecting machine as a possible source of contamination
Two or more different micro-organisms repeatedly isolated from two or more endoscopes.	Consider a failure in some aspect of cleaning or disinfection.	Consider stopping non-urgent endoscopy procedures while investigating. Review all cleaning and disinfection procedures, compliance and disinfecting machine function.

Adapted from SNZ HB 8149:2001, *Microbiological Surveillance of Flexible Hollow Endoscopes*.⁴⁴

must include the microbiological testing of the inner surfaces of the automated washer disinfectant, and the response if a positive microbiological result is obtained from a flexible channelled endoscope reprocessed in this manner.⁴⁴ The machine must not be used after a positive microbiological result until cleaned and proven to be microbiologically safe.

The manufacturer's instructions must be checked for compatibility of the endoscope with the automated endoscope washer disinfectant and disinfectant chemical, and to ensure that the item has been validated for the disinfecting process. Specific technical instructions must be developed on the use of an automated endoscope washer disinfectant for each type of endoscope.

When purchasing new endoscopes that will enter tissue normally considered to be sterile, consideration must be given to the endoscopes ability to withstand the wrapped sterilization method.

A positive microbiological result for an endoscope may represent either a breakdown in the cleaning and disinfection process or damage of the scope. Written protocols on the microbiological testing of flexible channelled endoscopes (including colonoscopes, duodenoscopes and bronchoscopes) must be in place in health organisations. The protocol must include the taking of microbiological samples, the frequency of sampling, the tracking of endoscopes, the interpretation of positive microbiological results and a plan of action when a response is required to a positive microbiological

result. Testing should be undertaken by a laboratory accredited by NATA for environmental sampling and in accordance with the recommendations and testing protocols stipulated by the Gastroenterological Nurses College of Australia Inc. and the Gastroenterological Society of Australia.^{7,42,43,44}

Table 10 outlines the recommended process for investigating a positive microbiological result of an endoscope.

4.11.2 Bronchoscopes¹³

As the lower airways are usually sterile, sterilization of all bronchoscopes is required. If a bronchoscope cannot tolerate sterilization, then high-level disinfection is the minimum level of reprocessing required.

When purchasing new bronchoscopes, consideration must be given to the scopes ability to withstand the wrapped sterilization method.

4.11.3 Reusable baby bottles/teats and breast feeding equipment^{45,46}

In health organisations, reusable baby bottles, teats and caps must be cleaned and thermally disinfected before reuse by another baby, and in accordance with the manufacturer's instructions. In addition, all reusable feeding equipment must be cleaned and thermally disinfected before reuse by another patient/baby.

Chemical disinfection must only be used for equipment that is designated to and reused by one patient or baby.

When teaching parents or carers about the preparation and use of infant formula prior to discharge, the healthcare worker should model their practices in all aspects of formula preparation and in the appropriate cleaning and chemical disinfection of equipment for the home setting.

Breast feeding equipment, such as breast pump components, must be cleaned and sterilized between patients.

4.11.4 Thermometers

Digital or tympanic thermometers must be cleaned according to the manufacturer's instructions after use and between patients.

Tympanic earpieces are labelled single use and must be discarded after each use.

Protective sheaths used on digital thermometers must be disposed of between patients. Their use does not negate the need to clean the thermometer between patients.

Glass thermometers used for an individual patient must be wiped with an alcohol preparation (80 per cent ethyl alcohol or 60–70 per cent isopropyl alcohol) after each use and stored dry. Glass thermometers that are used between patients, and their containers, must be washed in water and detergent and dried, then wiped with alcohol preparation and stored dry after each use.

4.11.5 Tonometer

There have been adenovirus outbreaks reported in eye clinic patients associated with the use of tonometers. Inadequate cleaning and disinfection procedures⁴⁷ were significant factors identified. Therefore, a single use tonometer should be considered in preference to a reusable tonometer when procuring new stock.

Reusable tonometers must be cleaned and disinfected using an appropriate method after each use.

4.11.6 Implantable devices⁷

Devices or items intended for human implantation must not be reprocessed or reused after patient use. Implantable devices must not be emergency 'flash' sterilized.

Implantable devices used for orthopaedic and dental surgery that are received wrapped with identification from the manufacturer, should not be opened and used to restock racks or trays.

4.12 Loaned reusable instruments and equipment⁷

Borrowed reusable instruments or equipment must undergo cleaning and disinfection or sterilization as appropriate for the intended use, prior to use. This applies to instruments and equipment loaned by sponsors and other health organisations, and instruments and equipment owned or brought to a health organisation by healthcare workers such as locums, visiting medical officers and staff specialists.

Following use, and before being returned, all loan items must be cleaned and disinfected or decontaminated through a sterilizer as appropriate.

Reusable loan instruments used on humans must not be used on animals, or for necropsy or autopsy.⁷

4.12.1 Sterilizing service contracts between health organisations

Sterilizing services that have signed service agreements/contracts with other health organisations, do not need to reprocess loan instruments or devices prior to use if those reusable instruments/devices have already been reprocessed. Written protocols must be in place for reprocessing, transporting, receiving and checking of these loan instruments.

4.13 Maintenance and repair of reusable medical instruments and equipment

Instruments, equipment or medical devices that are to be sent for maintenance or repair must be cleaned, disinfected or decontaminated through a sterilizer, according to manufacturer's recommendations, prior to dispatch.

4.14 Use of covers or sheaths on instruments and equipment

Single use covers or sheaths are designed to protect the instrument or equipment during procedures. Covers or sheaths must not be used as a substitute for routine cleaning, disinfection or sterilization of instruments and equipment between procedures.^{13,48}

4.15 Single use items/devices^{7,36,49,50,51}

Single use instruments and equipment are recommended if instruments and equipment are unable to be cleaned (adequately), are heat sensitive or unable to be disinfected or sterilized. Items or medical devices labelled single use are intended by the manufacturer to be used once and then discarded.

Re-use of medical instruments or equipment labelled single use, which enter or may enter sterile sites, must not occur unless the health organisation which reprocesses the items for reuse complies with the requirements of the *Therapeutic Goods Act 1989*³⁶ and the Therapeutic Goods (Medical Devices) Regulations 2002 (see PD2005_399 *Single Use Medical Devices (SUDs) Remanufacture*).

4.15.1 Devices labelled as 'single patient use'

'Single patient use' means a device has been approved for more than one episode of use on one patient only.

Unless the manufacturer specifies otherwise, devices labelled 'single patient use' can be reprocessed and reused on the same patient in accordance with the manufacturer's instructions.

4.15.2 Opened but unused single use device

A single use device that has its packaging opened, but the device was not used and/or did not come in contact with blood, tissue or bodily substances, is termed 'open but unused'.

The manufacturer must be consulted to determine:

- the instructions for reprocessing
- if the device is compatible with healthcare facility sterilizing equipment
- the recommended number of times the device can be reprocessed.

4.16 Reusable cannulated instruments⁷

For sterilization of reusable cannulated instruments to occur, all surfaces of the cannulated instrument must come in contact with the sterilant for the required time. Cannulated instruments may present reprocessing difficulties and therefore validation of the sterilizing method used is required.

4.17 Criteria for release of reprocessed items⁷

There must be evidence that the sterilization or disinfection process has complied with all specified requirements and the level of sterility or level of disinfection required has been achieved.

The person responsible for authorising release of items must have full knowledge of all aspects of the validation process and be satisfied that monitoring and control of the entire process has met the appropriate specifications.

Release of reprocessed items must be by one of two methods, parametric release or non-parametric release as outlined in AS/NZS 4187.

4.18 Contingency plan for retrieval of suspected unsterile or inadequately disinfected goods

PD2005_203: *Management of Reportable Infection Control Incidents* provides a framework for assessment of infection control breaches related to sterilization or disinfection failure.

In the event of a sterilizer failure the machine must not be used again until satisfactory results are obtained from physical, chemical or biological monitoring. Health organisations must have a contingency plan in place in the event of sterilization or disinfection failure.

If any item(s) used on a patient are subsequently found to be unsterile or inadequately disinfected, the health organisation must determine the extent of the problem in accordance with PD2005_203.

4.19 Difficult to clean reusable medical instruments⁵²

Health organisations must take into consideration those factors critical to reducing public health risks associated with difficult to clean reusable medical devices, such as:

- instrument/device design
- the risk assessment process
- policies and practices of health organisations and healthcare professionals
- availability of manufacturer's instructions for cleaning, disinfecting or sterilizing instruments and devices
- purchasing decisions
- availability of an alternative device labelled single use
- effective incident reporting and investigation programs.

SECTION 5

Environmental cleaning

This section should be read in conjunction with:

NSW Health. *Cleaning Service Standards, Guidelines and Policy for NSW Health Facilities.*

Deposits of dust, soil and microbes on surfaces are a potential source of healthcare associated infection.⁵³ The physical removal of micro-organisms and soil by wiping or scrubbing is probably as important as any antimicrobial effect of the cleaning agent used.⁵⁴

Health organisations must have a person responsible for the implementation, management and evaluation of their cleaning service. A means for evaluating the quality of cleaning practice is also required.

5.1 Management and risk⁵⁵

This section is based on the Victorian Department of Human Services *Cleaning standards for Victorian public hospitals*, a copy of the cleaning standards can be accessed online at: <http://www.health.vic.gov.au/cleaning>

Cleaning service delivery procedures must be documented and include:

- functional and health organisation reporting lines
- staffing levels and education
- minimum cleaning frequencies and methods, including chemicals used
- equipment used and care of equipment
- peak loads and contingency plans, including outbreak management
- performance standards
- management of the service.

The area within a health organisation to be cleaned should be broken down into generic functional areas. The functional areas can then be grouped according to the risks associated with inadequate cleaning in that area.

Very high risk

In very high risk functional areas cleaning standards require the highest level of intensity and frequency of cleaning.

High risk

Cleaning standards in high risk areas are maintained by frequent scheduled cleaning and a capacity to “spot” clean.

Moderate risk

Cleaning standards in moderate risk areas are important for both hygiene and aesthetic reasons and are maintained by routine scheduled cleaning with some capacity to spot clean in between.

Low/minimal risk

Cleaning standards in low risk areas are important for aesthetics and, to a lesser extent, hygiene and are maintained by cleaning on a routine basis with capacity to spot clean in between scheduled cleaning.

In the event of an outbreak of a transmissible disease or infection, eg gastroenteritis or a multi-resistant organism, the affected ward should be re-categorised to very high risk for the period of the outbreak.

5.2 Cleaning routine

Cleaning should be performed on a routine basis by trained staff using a standard method. Cleaning tasks must follow in a logical order from ‘clean’ to ‘dirty’ and ‘high’ to ‘low’.⁵⁶

A neutral detergent should be used for general cleaning. Disinfectants must not be used for general cleaning.^{57,58} Disinfectant fogging must not be used.

Care should be taken not to aerosolise cleaning agents. A dusting/cleaning method that limits aerolisation of dirt and dust particles is preferred over dry dusting.

5.2.1 Clinical environment

Work surfaces including patient care equipment, walls and blinds must be cleaned routinely and when visibly soiled. Frequently touched surfaces (eg computer keyboards, handrails, door knobs, bed side tables, tap handles) should be the focus of routine cleaning.

Table 11. Functional areas categorised according to risk

Very high risk	High risk	Moderate risk	Low/minimal risk
<ul style="list-style-type: none"> ■ Operating Theatres ■ Intensive Care Unit ■ Level 2 and 3 nurseries ■ Special needs areas, eg patients who are immunosuppressed, Haemodialysis units and areas used for insertion of central venous catheters ■ Ward involved in an outbreak of a transmissible disease or infection 	<ul style="list-style-type: none"> ■ Emergency Department ■ Central Sterilizing Service Department (CSSD) and sterile supply areas ■ Microbiology laboratories 	<ul style="list-style-type: none"> ■ General ward ■ Level 1 nursery ■ Kitchens ■ Cafeteria ■ Laboratories ■ Medical imaging (unless performing invasive procedures) ■ Public thoroughfares ■ Outpatient clinics ■ Pathology ■ Pharmacy ■ Procedure rooms ■ Treatment rooms ■ Waiting rooms ■ Mortuary area ■ Ambulance 	<ul style="list-style-type: none"> ■ Administrative areas ■ Non-sterile supply ■ Record storage and archives ■ Engineering workshop ■ Plant rooms ■ External surrounds

Healthcare workers should pay special attention to cleaning personal items such as pagers, stethoscopes, pens, mobile phones and lanyards.

Curtains should be changed and laundered routinely and when visibly soiled. Carpets in patient care areas should be vacuumed daily and steam cleaned on a regular basis.

Periodic cleaning of high areas, ceiling vents and infrequently accessed fixtures is also required.

Generally, there are no special cleaning requirements when additional precautions are in place. Infection Control staff should be consulted regarding the need for cleaning separately with a detergent and disinfectant.

Health organisations must select disinfectant agents for cleaning that are:

- listed on the Australian Register of Therapeutic Goods (ARTG) with the Therapeutic Goods Administration (TGA)
- appropriate for the purpose for which they are to be used
- best able to meet the health organisation's needs and cleaning requirements
- able to be used safely
- relevant and sensitive to epidemiologically important micro-organisms.

Manufacturer's instructions must be followed for the amount, dilution, and contact time of disinfectants. Before purchasing disinfection agents, expert infection control and microbiology advice should be sought.

When a patient is discharged, medical equipment, such as monitors, infusion devices and sphygmomanometers used for patient care must be cleaned and maintained according to the manufacturer's instructions.

5.3 Cleaning equipment

General purpose gloves must be worn when cleaning. If there is a likelihood of splashing during environmental cleaning, then a fluid-resistant gown, protective eyewear and mask/face shield must be worn.

Cleaning items, including solutions, water, buckets, cleaning cloths and mop heads must be changed and cleaned routinely and immediately following the cleaning of blood or body substance spills.

Cleaning equipment should include items such as mops with detachable heads for laundering and vacuums fitted with appropriate filters. Cleaning equipment must be stored dry between its use, well maintained, and designed to minimise the dispersion of dust during use. Handles on mops should be made of a non-porous material such as aluminum, not wood.

5.3.1 Colour coding of reusable cleaning equipment

Identification of reusable cleaning equipment utilised in the different areas of a health organisation is essential. Clear identification, by colour coding, of the various items of reusable cleaning equipment is the most effective method for restricting equipment to individual areas of health organisations. Colour coding should be used for all reusable equipment including, mop handles, buckets, reusable cloths and other appropriate equipment.

Health organisations must use the following colour coding for cleaning:

- Isolation (transmissible disease or infection) Areas
– YELLOW
- Toilets/Bathrooms/Dirty Utility Rooms
– RED
- Food Service/Preparation Areas
– GREEN
- General Cleaning
– BLUE
- Operating Theatres
– WHITE

5.4 Blood and body substance spills^{13,59}

In the event of spills of blood or body substances, staff involved in the management of spills must immediately:

- minimise traffic around the spill area
- don personal protective equipment
- use appropriate equipment to remove broken glass/sharps to prevent injury
- confine and contain the spill by using paper towels or disposable absorbent material to absorb the bulk of the blood or body substances
- treat contaminated disposable items as clinical waste
- place laundry items soaked with blood and body substances in a leak proof bag
- clean the spill site with a neutral detergent and water using standard
- cleaning equipment immediately the spill occurs. Contaminated articles must be cleaned or disposed of into clinical waste.

It is likely that products that can clean spills of blood or other body substances on fabric will cause damage to the fabric. Spills on fabric such as carpet and soft furniture should be managed as above, and in addition:

- cleaned with a neutral detergent
- removed from general use for professional cleaning
- carpet should be shampooed with an industrial carpet cleaner as soon as possible.

SECTION 6

Laundry and linen services

This section should be read in conjunction with:

- AS/NZS 4146: Laundry Practice
- AS/NZS 4480.1: Textiles for healthcare facilities and institutions – Medical sheepskins – Product specification and testing.

Health organisations must have documented policies on the collection, transport, and storage of linen. Health organisations that process or launder linen must have documented operating policies consistent with AS/NZS 4146.

The risk of disease transmission from soiled linen is negligible.⁶⁰ However, employees involved in the handling, transport and processing of used linen soiled with blood, body substances, secretions and excretions should carry out these tasks in a manner that prevents skin and mucous membrane exposure, contamination of clothing and transfer of micro-organisms to other persons and environments.

Clean linen must be stored:

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

Used/soiled linen should be handled as little as possible and with minimal agitation to prevent gross contamination of the air and of the linen handlers, and should be put in bags at the point of generation.

Double bagging of linen is not necessary in most circumstances. Linen heavily soiled with blood or body substances, or other fluids that have potential to leak, should be contained, stored and transported in leak proof bags contained within the linen bag.

Linen bags should not be overfilled and should be emptied when three quarters full. Overfilling will prevent closure and increase the risk of rupture in transit and injury to handlers.

Sharps and other objects must not be discarded into linen bags.

Clean linen and used/soiled linen must not be transported together.

Domestic type washing machines must only be used for a patient's personal items. Washing must involve the use of an appropriate detergent and hot water. If hot water is not available, then only individual patient loads can be washed at one time. Clothes dryers should be used to dry a patient's personal items. Used/soiled linen must not be rinsed or sorted in patient care areas or washed in domestic washing machines.

Specific clinical practices and settings

The following precautions are the minimum set of standards for specific clinical practices and settings and must be adopted in addition to standard precautions. Each health organisation must develop comprehensive written protocols on specific clinical practices.

Aseptic techniques must be adopted for invasive procedures and for the administration of sterile medication and solutions.

7.1 Cryotherapy^{13,61}

Care should be taken to ensure that liquid nitrogen canisters do not become contaminated during cryotherapy procedures as viruses and bacteria may survive immersion in liquid nitrogen.

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 sterilized after each patient use. A disposable cotton-tipped applicator should be used for each application. The residual and disposable cup or dish 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.

7.2 Emergency resuscitation

Resuscitation devices must be used during cardiopulmonary resuscitation (CPR) to prevent direct contact between the mouth of the resuscitator and the person being resuscitated. Therefore, individual resuscitation devices (masks) must be available and accessible in all patient care areas.

CPR training provided or approved by the health organisation must include instructions in the use of resuscitation devices to prevent direct contact between the mouth of the resuscitator and the patient.

7.2.1 CPR training using a mannequin

A resuscitation device should be used during CPR training provided or approved by the health organisation that involves a mannequin. If a device is not used, then the mannequin face piece must be changed and reprocessed appropriately between each healthcare worker.

All one-way valves and filters must be dedicated to the use of one trainee then discarded after use.

The lungs of CPR training mannequins must be discarded following each session and a new set of lungs used for each training session. Mannequins that do not have removable lungs must be cleaned and reprocessed according to the manufacturer's instructions.

7.3 Equipment for individual patient use

Equipment, which is labelled by the manufacturer for individual patient use, including insulin pens and asthma spacers, must not be used for more than one patient or resident. Reprocessing of such devices must be in accordance with the manufacturer's instructions and section 4.15.3 of this document, Devices labelled as 'single patient use'.

7.4 Glucometer

Particular care must be taken when using equipment for monitoring blood glucose levels as this type of equipment has been implicated in the transmission of blood borne viruses. To prevent transmission of blood borne viruses between patients, healthcare workers must:

- not reuse the platform or barrel supporting a disposable lancet on multiple patients
- dispose of the glucose lancets after each use
- not store used lancets with unused lancets
- wear gloves when performing fingersticks
- perform hand hygiene between patients

- ensure there is no contamination of other equipment surfaces or the patient (eg a healthcare worker's gloves or hands come into contact with contaminated blood glucose monitors or insulin vials and transfer the virus to the finger stick or injection site of a patient).

A glucometer that is owned by a patient is for the sole use of that patient.

When a glucometer owned by the health organisation is used for monitoring glucose blood levels on more than one patient, it must be cleaned between each use.

7.5 Haemodialysis setting

Haemodialysis has been associated with transmission of blood borne viruses. Infection may occur from contamination during the haemodialysis procedure or via the dialysis system, from breaks in established procedures, due to lack of monitoring for known contaminants, due to reprocessing failure, or inadequately trained/educated staff.^{62,63,64,65}

Risk of blood borne infection in the haemodialysis setting may be reduced by:⁶³

- adherence to standard precautions
- adherence to procedures for disinfection and maintenance of equipment according to manufacture's instructions
- a patient education program that includes teaching patients and their families their role in prevention of infections
- routine monitoring and follow up of patients undergoing haemodialysis in relation to blood borne viruses status
- hepatitis B vaccination for all susceptible haemodialysis patients and staff
- separation of patients who are positive for HBsAg by room or area and use of a dedicated machine.

Although outbreaks of hepatitis C (HCV) have been reported in haemodialysis patients, efficiency of transmission appears low. There is insufficient evidence to justify routine use of dedicated machines for dialysis or isolation of patients who are positive for anti-HCV and HIV antibody.

7.6 Home, community and ambulance setting

The home, community and ambulance setting is an informal unstructured environment for healthcare and lacks the amenities of a health organisation. However, standard precautions must be maintained and the use of additional precautions implemented as appropriate.

Implementing standard precautions in these settings may require a variation in practice, such as the use of single-use towelettes impregnated with soap for visibly soiled hands when access to clean running water is difficult. The containment of waste (including sharps) and medical equipment for transport must be consistent with infection control principles.

Where additional precautions are required for the care of the patient the health organisation must ensure appropriate equipment is available and is supplied to the healthcare worker with the appropriate means for disposal.

Notification to air or road ambulance services staff of a patient with a transmissible disease, and/or healthcare associated infection, must occur prior to transport to ensure that appropriate infection control precautions are used by both the ambulance service staff and the patient.

7.7 Invasive procedures

7.7.1 Intravascular access⁶⁶

Measures to minimise the risk of infection associated with intravascular therapy include:

- hand hygiene before catheter insertion or catheter maintenance
- aseptic technique for all intravascular catheter insertions and manipulations
- use of gloves for insertion (sterile gloves for central venous catheter insertion)
- use of a large sterile drape to ensure a sterile field is maintained during central venous catheter insertion
- a clean insertion site and the use of an appropriate antimicrobial agent before catheter insertion
- appropriate skin contact time for the antimicrobial to be effective
- use of a transparent, semi permeable polyurethane dressing.

Antimicrobial ointments should not be applied to catheter placement sites. Both healthcare workers and patients must wear protective eyewear if there is a risk of splash from either body substances or antiseptic agents during catheter insertion and manipulation.

Each health organisation must have written protocols for the care and management of all types of intravascular devices.

7.7.2 Surgical procedures

Clipping must be used as the standard process for hair removal and occur immediately before the operation. Pre-operative shaving must not occur unless clinically indicated. If indicated, shaving should be performed immediately before the operation.²⁴

If alcohol based skin preparations are used then the preoperative skin preparation should be completed in a manner which prevents pooling of alcohol based skin preparations under the patient, or splashing into the patient's eyes.

In cases where it is technically feasible, retractors must be used for exposure and access during an invasive procedure. During an invasive procedure fingers must not be used for the purpose of retraction or to increase access for the passage of a suture or other sharp instruments/equipment.

As much blood as possible should be cleaned from the patient's skin after the operation. The skin should be closed with staples whenever possible or practicable. Closed wound drainage systems should be used.

Wound dressings should be selected according to the wound type, the amount of expected exudate and, if appropriate, a dressing with an impervious outer covering should be used.

7.7.3 Urinary catheterisation⁶⁷

Healthcare workers responsible for the insertion or management of indwelling urinary catheters must understand the risks of infection, and the rationale for procedures designed to prevent infection, and be trained in the correct techniques of aseptic catheter insertion and management.

Measures to minimise the risk of infection associated with indwelling urinary catheterisation include:

- use of aseptic technique for urinary catheter insertion and management

- use of sterile equipment and sterile gloves when inserting a urinary catheter
- connecting the urinary catheter to a closed drainage system
- obtaining urine samples from a sample port, or by aseptic aspiration
- use of a dedicated receptacle for measuring or emptying a urinary catheter bag, and decontaminating the receptacle appropriately between each patient use
- ensuring the urinary drainage bag is not allowed to lie on the floor.

Facial protection must be worn if the risk of splash injury is likely. Hand hygiene must be performed and gloves worn before any manipulation of the catheter system.

7.8 Ophthalmic and optometry equipment used on external eye¹³

The cornea and conjunctiva are classified as semi critical sites.

Contact lenses must not be shared. Diagnostic contact lenses should be reprocessed in accordance with the manufacturer's recommendations.

Products used for cleaning and disinfecting ophthalmic equipment used on the external eye must not be harmful to the eye. The equipment must be rinsed thoroughly and dried to ensure no residual chemical is left on it so that no eye damage occurs.

Single use or disposable ophthalmic equipment should be considered where reprocessing cannot be achieved in accordance with requirements.

7.9 Oral health organisations

Oral healthcare workers are routinely exposed to high concentrations of aerosols and splatter during dental procedures, and their practice must be consistent with GL2005_037: *Infection Control guidelines for oral healthcare facilities*.

7.10 Pets

GL2006_012: *Guidelines for the Use of Therapy Companion Animals in Public and Private Hospitals* outlines the appropriate steps to be taken in implementing a program of animal assisted intervention

in NSW public and private health organisations. Health organisations implementing a program of animal assisted intervention need to consider their responsibilities under the *Companion Animals Act 1998* and *Companion Animals Regulation 1999*.

7.11 Post-mortem care and examination^{68,69}

This section must be read in conjunction with the following documents:

- PD2005_352: *Coroners' cases and amendments to Coroners Act 1980*
- *NSW Public Health Act, 1991*.

Practices for post-mortem must minimise the risk of exposure of healthcare workers to a transmissible disease or infection and minimise the risk of infection being passed from the autopsy room to others and the environment.

When handling bodies of deceased persons or undertaking post mortem examinations, standard precautions are required at all times. Depending on the known or suspected infectious status of the body, additional precautions may also be required and should be maintained until the body is completely "enclosed" for transport.

Precautions should include engineering controls, work practices and the use of personal protective equipment. 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 before reuse as per Section 4 of this policy
- instruments used on cases of known or suspected CJD should be handled in accordance with Australian Government Department of Health and Ageing, *Infection Control in the HealthCare Setting: Guidelines for the Prevention of Transmission of Infectious Diseases*¹³
- engineering controls such as ventilation, and safety devices for autopsy equipment, should be in place. Sharps injuries may be minimised by using cut resistant gloves and blunt dissection techniques^{70,71,72}
- respiratory protection (P2 mask), and protective eyewear or face shield, must be used whilst performing aerosolising procedures during post mortem.

7.12 Pre-operative pathology testing

An assessment of the need for pre-operative pathology testing should preferably be undertaken as part of the clinical history performed by the medical practitioner of first contact. This may be a general practitioner, or a medical practitioner in emergency department, the outpatient department or private rooms. In the case of elective surgery, any testing considered relevant should be completed prior to admission.

Pre-operative testing of a patient for infectious agents, including blood borne viruses, is a clinical decision and medical practitioners must exercise their judgement following assessment of the patient, and order any clinically relevant tests with the patient's informed consent. Testing for blood borne viruses must also include pre and post-test discussion.⁷³

7.13 Respiratory and anaesthetic apparatus

Respiratory, anaesthetic, resuscitation and similar apparatus including ambubags and ventilator circuits are semi-critical items and must be cleaned then either disinfected or sterilized after each use. If items cannot withstand disinfection or sterilization, then single use disposable items must be used.¹³

7.13.1 Anaesthetic apparatus

All anaesthetic apparatus which comes into contact with a patient, or any part of the apparatus contaminated with blood or body substances, must be either discarded, if single use, or cleaned and either disinfected or sterilized after each patient. Those parts of the breathing circuit not in contact with a patient, and not contaminated with blood or body substances after each patient use, should be cleaned and thermally disinfected at the end of each session.

If the anaesthetic breathing circuit uses a filter, the filter must be discarded after each patient. The part of the breathing circuit between the patient and the filter must either be discarded if single-use or cleaned and disinfected or sterilized after each patient.

If the breathing circuit does not use a filter, the complete breathing circuit must either be discarded, if single use, or cleaned and disinfected or sterilized after each patient use.

In situations where a carbon dioxide absorber is also used, the part of the breathing circuit between the carbon dioxide absorber and the filter must either be

discarded, if single use, or cleaned and disinfected or sterilized at the end of each procedure or operation list. In those cases where a carbon dioxide absorber is not used, the breathing circuit tubing that conducts the gas to and from the filter must either be discarded if single use or cleaned and disinfected or sterilized at the end of each procedure or operation list.

7.13.2 Nebuliser

Nebulisers are thought to increase the risk of airborne spread for some transmissible diseases (eg SARS) and therefore, a spacer should be used. Where it is not feasible to use a spacer, a nebuliser can be used in a designated area where other patients will not have exposure to the aerosol.

7.13.3 Use of filters on respiratory devices

Wherever a 'blow-and-inhale' procedure is to be performed, a filter must be used. The use of filters does not interfere with the quality of the recordings.

Equipment, such as older types of spirometers, which has positive pressure while in use, requires a filter.

Respiratory equipment designated for use on one person only, does not require a filter.

7.14 Sterile medications and solutions

Injectable products packaged in multi-dose vials or ampoules (or other similar containers) must not be used except where the product is intended solely for the exclusive use of a single patient^{13,74} or there is no other alternative available on the Australian pharmaceutical market. Where there is no other alternative, precautions must be taken to ensure that the injection of contaminated material or fluid into a multi-dose vial or ampoule (or other similar container) does not happen.

Injectable medication or solution must be taken from a vial or ampoule (or other similar container) using a sterile needle and syringe to withdraw the contents. The needle must be discarded into a sharps container.

Open multi-dose lotion or cream pots/containers must not be used unless they are for an individual patient's use. A collapsible squeeze tube/bottle, pump pack or valve should be used to dispense lotion or cream from a multi-dose container. Once the product is empty both the container and pump pack should be disposed.

7.15 Toys

Toys and other objects that are handled or placed in children's mouths, or used in baths, must be washable. These items must be washed with detergent and water and allowed to dry between each patient use. Ward utensil washers may be suitable for toy washing.

Water retaining bath toys, non-washable soft toys and toys which are difficult to clean and dry must not be used in health organisations. Such toys may be limited to single patient use only and are then required to be disposed.⁷²

If a patient brings their own toy/s into a health organisation, only that patient must use them. Cleaning instructions should be discussed with the patient/carer.

SECTION 8

Outbreak management

This section should be read in conjunction with the following documents:

- NSW Health, *Notifiable Diseases Manual*
- PD2005_203: *Management of Reportable Infection Control Incidents*
- PD2005_234: *Effective Incident Response: A Framework for Prevention and Management in the Health Workplace*
- PD2006_014: *Notification of Infectious Diseases under the Public Health Act 1991*
- PD2006_030 *Incident Management Policy*
- PD2006_070 *Lookback*.

An outbreak can be defined as the incidence of infections greater than the expected rate within a specific area over a defined period of time.^{13,76,77}

Outbreaks may occur from either healthcare associated infections or transmissible communicable diseases.

The main goal of managing an outbreak is to prevent a further increase in incidence of infection, and identify factors that may have contributed to the outbreak.

This allows for the development and implementation of measures to prevent future outbreaks.

The health organisation or area health infection control committee should initially provide advice for the management and investigation of suspected outbreaks. In the event of a large outbreak of a notifiable disease the local public health unit must be contacted.

Resources

The following is a list of resource sites for HealthCare Workers to assist with the local implementation of this policy.

- **NSW Department of Health**
<http://www.health.nsw.gov.au/>
- **NSW Department of Health, Infection Control**
http://www.health.nsw.gov.au/health_pr/infection/
- **NSW Department of Health, Disease Fact sheets**
<http://www.health.nsw.gov.au/infect/facts.html>
- **The NSW Infection Control Resource Centre**
Tel: 93329712 or,
email: albicr@sesiahs.health.nsw.gov.au
<http://www.sesahs.nsw.gov.au/albionstcentre>
- **Australian Infection Control Association**
<http://www.aica.org.au/docs/home/index.asp>
- **NSW Infection Control Association**
<http://www.icansw.org.au/>
- **Sterilizing Research and Advisory Council of Australia**
<http://www.sracansw.org.au/>
- **Gastroenterological Society of Australia**
<http://www.gesa.org.au/>
- **Gastroenterological Nurses College of Australia**
<http://www.genca.org/>
- **UK Infection Control Nurses Association**
<http://www.icna.co.uk/default.asp>
- **Community and Hospital Infection Control Association – Canada**
<http://www.chica.org/>
- **Association for Professionals in Infection Control and Epidemiology**
<http://www.apic.org/>
- **The NSW Food Authority**
Industry Guide to Developing Food Safety Program (Hospitals and Aged Care)
<http://www.foodauthority.nsw.gov.au>
- **Workcover NSW**
<http://www.workcover.nsw.gov.au/default.htm>
- **Standards Australia and New Zealand**
<http://www.standards.com.au/>
- **NSW Department of Environment and Conservation**
<http://www.environment.nsw.gov.au/index.htm>
- **Australian Government Department of Health and Aging**
<http://www.health.gov.au/>
- **Australian Government Department of Health and Aging – Managing Infectious Diseases in Healthcare setting (Creutzfeldt-Jakob Disease)**
[http://www.health.gov.au/internet/wcms/Publishing.nsf/content/icg-guidelines-index.htm/\\$FILE/part4.pdf](http://www.health.gov.au/internet/wcms/Publishing.nsf/content/icg-guidelines-index.htm/$FILE/part4.pdf)
- **Australian Government Department of Health and Aging Therapeutic Goods Administration**
<http://www.tga.gov.au/>
- **World Health Organisation**
<http://www.who.int/en/>
- **Centres for Disease Control and Prevention**
<http://www.cdc.gov/>
- *AS/NZS 4815 Office-based health care facilities – reprocessing of reusable medical and surgical instruments and equipment, and maintenance of the associated environment.*

APPENDIX 1

Infectious disease list requiring additional precautions

This table provides a summary of infectious diseases for which Additional Precautions are recommended. It does not include all infectious diseases and should be read in conjunction with the *Australian Government Infection Control Guidelines*.^{13,54,78,79}

Disease	Precautions			Comments
	Airborne	Droplet	Contact	
Avian Influenza (Highly Pathogenic Influenza)	✓	✓	✓	Airborne = negative pressure room if available and P2 mask Droplet = eye protection or face shield Contact = gown/apron, gloves
Adenovirus Pneumonia		✓	✓	Droplet = eye protection or face shield and surgical mask Contact = gown/apron, gloves
Clostridium difficile			✓	It is recommended that HCWs perform hand hygiene with liquid soap and water after direct contact with patient
Congenital rubella Infants to 1 years		✓	✓	Droplet = eye protection or face shield and surgical mask Contact = gown/apron, gloves
Enteroviral infections Children <6 years and incontinent patients			✓	
Giardiasis Children <6 years and incontinent patients			✓	
Hemorrhagic fevers (Marburg, Lassa and Ebola)	✓	✓	✓	Airborne = negative pressure room if available and P2 mask Droplet = eye protection or face shield Contact = gown/apron, gloves Patients must be transferred immediately to designated hospital (Westmead Hospital) for appropriate isolation. Refer to Contingency Plan for VHF.
Hepatitis A Children <6 years and incontinent patients			✓	
Hepatitis E Children <6 years and incontinent patients			✓	
Haemophilus influenzae, known or suspected		✓		Depending on invasive site of infection – consult with infection control
Impetigo			✓	
Influenza (Seasonal)		✓	✓	Droplet = eye protection or face shield and surgical mask Contact = gown/apron, gloves
Legionnaires' disease				Standard Precautions (no evidence of person-to-person transmission)
Lice (pediculosis)			✓	Patient should not be cohorted unless treatment is concurrent.
Measles	✓			Unvaccinated and susceptible persons should not enter room. Room to remain vacant for 2 hours post discharge for infectious patients.

Disease	Precautions			Comments
	Airborne	Droplet	Contact	
Multidrug-Resistant Organisms, infection or colonization eg VRE, MRAB, MRSA			✓	
Mumps (Infectious parotitis)			✓	Unvaccinated and susceptible persons should not enter room.
Neisseria meningitidis (meningococcal disease)		✓		Isolation can be discontinued after 24 hours of appropriate antibiotic therapy.
Norovirus	✓		✓	P2 mask when there is potential for aerosol dissemination eg patient vomiting or toileting (diarrhoea), disposing of faeces. Airborne = negative pressure room if available and P2 mask Contact = gown/apron, gloves Ensure consistent environmental cleaning and disinfection.
Pandemic Influenza ⁸⁰	✓	✓	✓	Airborne = negative pressure room if available and P2 mask Droplet = eye protection or face shield Contact = gown/apron, gloves
Parvovirus B19		✓		Maintain precautions for duration of hospitalisation when chronic disease occurs in an immunodeficient patient
Pertussis (Whooping cough)		✓		Unvaccinated and susceptible persons should not enter room
Respiratory Syncytial virus (infants and young children, and immunocompromised adults)		✓	✓	Droplet = eye protection or face shield and surgical mask Contact = gown/apron, gloves
Rotavirus			✓	Ensure consistent environmental cleaning and disinfection; prolonged shedding may occur in the immunocompromised person
Rubella		✓	✓	Unvaccinated and susceptible persons should not enter room Droplet = eye protection or face shield and surgical mask Contact = gown/apron, gloves
SARS	✓	✓	✓	Airborne = negative pressure room if available and P2 mask Droplet = eye protection or face shield Contact = gown/apron, gloves
Scabies			✓	
Shigella species Children <6 years and incontinent patients		✓		
Streptococcal Group A infections Infants and young children only		✓	✓	Droplet = eye protection or face shield and surgical mask Contact = gown/apron, gloves
Streptococcal Pneumonia or Scarlet fever		✓	✓	Droplet = eye protection or face shield and surgical mask Contact = gown/apron, gloves Isolation can be discontinued after 24 hours of appropriate antibiotic therapy
Tuberculosis (including Multi Drug Resistant TB) Pulmonary or laryngeal disease, confirmed or suspected	✓			
Varicella-zoster Disseminated	✓		✓	Airborne = negative pressure room if available and P2 mask Contact = gown/apron, gloves Unvaccinated and susceptible persons should not enter room
Varicella (chickenpox)	✓		✓	Airborne = negative pressure room if available and P2 mask Contact = gown/apron, gloves Unvaccinated and susceptible persons should not enter room

Australian Government guidelines¹³ <http://www.health.gov.au/internet/wcms/publishing.nsf/content/icg-guidelines-index.htm>

References

- 1 New South Wales, *Medical Practice Act 2003*, NSW Government Information Service, Sydney.
- 2 New South Wales, *Nurses and Midwives Act 1991*, NSW Government Information Service, Sydney, 2001.
- 3 New South Wales, *Dental Practice Act 2001*, NSW Government Information Service, Sydney.
- 4 New South Wales, *Dental Technicians Registration Act 2003*, NSW Government Information Service, Sydney.
- 5 New South Wales, *Physiotherapist Act 2001*, NSW Government Information Service, Sydney.
- 6 New South Wales, *Podiatrist Act 2003*, NSW Government Information Service, Sydney.
- 7 Australia/New Zealand Standards, 2003, AS/NZS 4187: *Cleaning, Disinfecting and Sterilizing Reusable Medical and Surgical Instruments and Equipment, and Maintenance of Associated Environments in HealthCare Facilities*, Sydney.
- 8 Australia/New Zealand Standards, 2006, AS/NZS 4815: *Office-based healthcare facilities – Reprocessing of reusable medical and surgical instruments and equipment, and maintenance of the associated environment*, Sydney.
- 9 New South Wales, *Occupational Health and Safety (OH&S) Act 2000*, NSW Government Information Service, Sydney.
- 10 Scheckler W E, et al. 1998, *Requirements for infrastructure and essential activities of infection control and epidemiology in hospitals: A consensus panel report*, Infection Control and Hospital Epidemiology, 19:114–124.
- 11 Halligan A, Donaldson L, 2001, *Implementing clinical governance: turning vision into reality*, British Medical Journal, 322:1413–17.
- 12 Boyce J, Pittet D, 2002, *Guideline for hand hygiene in healthcare settings: recommendations of the healthcare infection control practices advisory committee and the HICPAC/SHEA/APIC/IDSA hand hygiene task force*, Infection Control and Hospital Epidemiology, 23(12) (suppl.):S3–S41.
- 13 Australian Government Department of Health and Ageing, Communicable Disease Network Australia and the National Centre for Disease Control, 2004, *Infection Control in the health care setting: Guidelines for the prevention of transmission of infectious diseases*, Canberra.
- 14 Gordin F, Schultz M, Huber R & Gill J, 2005, *Reduction in Nosocomial Transmission of Drug-Resistant Bacteria After Introduction of an Alcohol-Based handrub*, Infection Control and Hospital Epidemiology, 26,7: Health & Medical Complete.
- 15 Picheansathian W, 2004, *Effectiveness of alcohol-based solutions for hand hygiene: a systematic review*, Health Care Reports, 2 (4).
- 16 Boyce J, Pittet D, 2002, *Guideline for hand hygiene in health care settings: recommendations of the health care infection control practices advisory committee and the HICPAC/SHEA/APIC/IDSA hand hygiene task force*, Infection Control and Hospital Epidemiology, 23(12) (suppl.):S3–S41.
- 17 Grahan M, 1990, *Frequency and duration of hand washing in an intensive care unit*, American Journal of Infection Control, 18:77–80.
- 18 Barry M A, Craven D E, Goularte T A, Lichtenberg D A, 1984, *Serratia marcescens contamination of antimicrobial soap containing triclosan: implications for nosocomial infection*, Infection Control, 5:427–430.
- 19 Queensland Health, 2001, *Infection Control Guidelines, Handwashing*, Brisbane.
- 20 Patrick D R, Findon G, Miller T E, 1997, *Residual moisture determines the level of touch-contact-associated bacterial transfer following hand washing*, Epidemiology Infection, 119:319–25.
- 21 NSW Department of Health, 2004, *Policy Guideline 2005_052: Health Facility Guidelines – NSW Health, Asset Management Services*, Sydney. <http://www.healthdesign.com.au/nsw.hfg/>
- 22 Hannigan P, Shields J W, 1998, *Handwashing and use of examination gloves*, The Lancet, vol. 351, Issue 9102.
- 23 ACORN, 2006, *ACORN Standards for Perioperative Nursing*, Adelaide.

- 24 Royal Australian College of Surgeons, revised 2001, *Policy on Infection Control in Surgery*, Melbourne.
- 25 Australia/New Zealand Standards, 2002, AS/NZS 4381: *Single use facemasks for use in health care*.
- 26 Australia/New Zealand Standards, 1994, AS/NZS 1715: *Selection, use and maintenance of respiratory protection devices*.
- 27 Australia/New Zealand Standards, 2003, AS/NZS 1716: *Respiratory protective devices*.
- 28 The Hospital Infection Control Practices Advisory Control Committee, 2004, *Guideline for Isolation Precautions: Preventing transmission of infectious agents in the health care setting*, Health care Infection Control Practice Advisory Committee.
- 29 Centers for Disease Control and Prevention, 2005, *Guidelines for preventing the transmission of mycobacterium tuberculosis in health-care facilities*. <http://www.cdc.gov/>
- 30 Commonwealth Department of Health and Family Services, National Health and Medical Research Council (NHMRC), 1999, *National guidelines for waste management in the health care industry*, Canberra.
- 31 Davis M, 1998, *Managing the risk of bloodborne exposures*, Surgical Services Management, 4(9):46–48
- 32 Folin A, Nyberg B, Nordstrom G, 2000, *Reducing blood exposures during orthopaedic surgical procedures*, AORN Journal, 71(3): 573–582.
- 33 Telford G L, Quebbeman E J, 1993, *Assessing the risk of blood exposure in the operating room*, American Journal of Infection Control, 21:351–6.
- 34 Gerberding L, 1993, *Procedure specific infection control for preventing intraoperative blood exposures*, American Journal of Infection Control, 21:363–7.
- 35 Jagger J, Bentley M, Tereskerz P, 1998, *A study of patterns and prevention of blood exposures in OR personnel*, AORN Journal, 67(5): 979–996.
- 36 Australian Government Department of Health and Ageing, *Therapeutic Goods Administration, Therapeutic Goods Act 1989*, Canberra.
- 37 Australian Government Department of Health and Ageing, 1996, Therapeutic Goods Order No. 54: *Guidelines for the evaluation of sterilants and disinfectants*, Canberra.
- 38 NSW Health, 2003, Health Procurement, *Guidelines for Storage and Handling of Pre-Sterilized Consumables*, AS/NZ 4187 Working Party, Sydney. http://www.pctg.com.au/library/guideline_as4187_apr03.pdf
- 39 International Organisation for Standardization (ISO), 2006, ISO 15883–1, *Washer-disinfectors – Part 1: General requirements, definitions and tests*, American National Standards Institute.
- 40 Mayhall, C G, (Ed.), 1996, *Hospital Epidemiology and Infection Control*, Williams & Wilkins, Baltimore.
- 41 NSW Department of Health, 2005, Policy Directive 2005_108: *Glutaraldehyde in NSW Public Health Care Facilities (Policy and Guidelines for the Safe Use of)*, Sydney.
- 42 Deva A K, et al, 1998, *Detection of persistent vegetative bacteria and amplified viral nucleic acid from in-use testing of gastrointestinal endoscopes*, Journal of Hospital Infection, 39:149–157.
- 43 Gastroenterological Society of Australia and Gastroenterological Nurses College of Australia, 2003, *Infection control in endoscopy: Guidelines* (2nd Edition), Gastroenterological Society of Australia, Sydney.
- 44 Standards New Zealand, 2001, SNZ HB 8149: *New Zealand handbook: Microbiological Surveillance of Flexible Hollow Endoscopes*, Ministry of Health, Manat Hanuora.
- 45 NSW Food Authority, 2005, *Industry guide to Developing Food Safety program (Hospitals and Aged Care)*. <http://www.foodauthority.nsw.gov.au/fb-hospitals.htm>
- 46 NHMRC, 2003, *Dietary Guidelines for Children and Adolescents in Australia: Infant Feeding Guidelines for Health Workers*, Canberra.
- 47 Manika R L, 2000, *Epidemic Keratoconjunctivitis* (in Pfeiffer JA), APIC test of infection control and epidemiology, Association for Professionals in infection control and epidemiology Inc., Washington. 1–86.4.
- 48 Baker K, Chaput M, et al, 1999, *Evaluation of endoscope sheaths as viral barriers*, Laryngoscope, 109(4); 636–639.
- 49 Australian Government Department of Health and Ageing, Therapeutic Goods Administration, 2005, *Australian medical devices guidance document number 25: classification of medical devices*, Canberra.
- 50 Australian Government Department of Health and Ageing, Therapeutic Goods Administration, 2005, *FAQ on regulation of the re-manufacture of single use medical devices*, Canberra. <http://www.tga.gov.au/devices/sudfaq.htm>
- 51 NSW Health, 2004, Policy Directive 2005_399 *Single Use Medical Devices (SUDs) Remanufacture*, Sydney.
- 52 Australian Government Department of Health and Ageing, Therapeutic Goods Administration, 2004, National Co-ordinating Committee on Therapeutic Goods, *Reducing public health risks associated with reusable medical devices*, Canberra.

- 53 Chou T, Environmental Services, 1996, (In R.N. Olmsted), (Ed.). *APIC infection control and applied epidemiology: Principles and practice*, Mosby, St Louis. 107–111.
- 54 The Hospital Infection Control Practices Advisory Control Committee, Centers for Disease Control and Prevention, 2003, *Guideline for Environmental Infection Control in Health care Facilities*, Centres for Disease Control and Prevention, Atlanta.
- 55 Victorian Government Department of Human Services, 2000, *Cleaning standards for Victorian public hospitals*, State Government of Victoria, Melbourne. Revised 2005.
- 56 Queensland Health, 2001, *Infection Control Guidelines, Environmental Cleaning*, Brisbane.
- 57 Allerberger F, Ayliffe G, et al, 2002, *Routine surface disinfection in health care facilities: should we do it*, *American Journal of Infection Control*, 30(5): 318–319.
- 58 Daschner F, Schuster A, et al, 2005, *No routine surface disinfection*, *American Journal of Infection Control*, 32(8): 513–515.
- 59 Rutala W, Weber J, 2004, *The benefits of surface disinfection*, *American Journal of Infection Control*, 32(4): 226–231.
- 60 Hospital Infections Program, National Center for Infectious Diseases, Centers for Disease Control and Prevention, 2000, *Laundry: General information*. http://www.cdc.gov/ncidod/dhqp/bp_laundry.htm
- 61 The Australasian College of Dermatologists, 2004, *Guidelines for Infection Control in the Practice of Dermatology*, Boronia Park, NSW.
- 62 Garcia-Houchins S, 2000, *Dialysis* (In J.A. Pfeiffer), (Ed.), *APIC text of infection control and epidemiology*, Association of Professionals in Infection Control and Epidemiology Inc., Washington.
- 63 Center for Disease Control and Prevention, 2001, *Recommendations for preventing transmission of infection among chronic haemodialysis patients*, *MMWR* 2001:50(No.RR–5).
- 64 Schneeberger I K, et al, 2000, *The prevalence and incidence of hepatitis C virus infections among dialysis patients in the Netherlands: A nationwide prospective study*, *Journal of Infectious Diseases*, 82: 1291–9.
- 65 Aloys C M, et al, 1998, *Hepatitis B and Hemodialysis: The impact of universal precautions in preventing the transmission of bloodborne viruses*, *Infection Control and Hospital Epidemiology*, 19: 508–510.
- 66 Centers for Disease Control and Prevention, 2002, *Guidelines for the prevention of intravascular catheter related infections*, *MMWR*: 51(10): 1–36.
- 67 Victoria Rural Infection Control Practice Group, 2002, *Infection Prevention and Control Manual*, Victoria.
- 68 Healing T D, Hoffman P N, Young S E, 1995, *The infection hazards of human cadavers*, *Communicable Disease Report*, 5 (5): R61–R68.
- 69 Young S E J, Healing T D, 1995, *Infection in the deceased: a survey of management*, *Communicable Disease Report*, 5 (5): R68–R73.
- 70 Pugliese G, Favero M S, 1997, *First reported case of occupationally acquired HIV from autopsy*, *Journal of Infection Control and Epidemiology*, 18 (4): 243–244.
- 71 McDonald L L, 1996, *Post-mortem care*, In R.N. Olmstead, (Ed.), *APIC infection control and applied epidemiology: Principles and practice*, Mosby, St Louis.
- 72 National Occupational Health and Safety Commission, 1995, *Infectious disease control: Post-mortem procedures*, Worksafe Australia, Sydney.
- 73 NSW Health, 1992, *Policy Directive 2005_048: HIV Antibody Testing-Counselling guideline*, Sydney.
- 74 Australian Government Department of Health and Ageing, Therapeutic Goods Administration, 2001, *Australian Drug Evaluation Committee, Resolution No. 7813*. <http://www.tga.gov.au/docs/html/adec/adec.htm>
- 75 BATTERY J P, Alabaster S J, Heine F G, et al, 1998, *Multi-resistant Pseudomonas aeruginosa outbreak in a pediatric oncology ward related to bath toys*, *Pediatric Infectious Disease Journal*, 17:509–13.
- 76 Reingold A L, 1998, *Outbreak investigations; A perspective*, *Emerging Infectious Diseases*, 4 (1): 21–27.
- 77 Checko P J, 1996, *Outbreak investigation* (In R.N. Olmsted), (Ed.), *APIC infection control and applied epidemiology: Principles and practice*, Mosby, St Louis.
- 78 Australian Government Department of Health and Ageing, Communicable Disease Network Australia and the National Centre for Disease Control, 2003, *Australian Infection control Guidelines for severe Acute Respiratory Syndrome (SARS)*, Canberra.
- 79 Heyman D L, 2004, *Control of Communicable Diseases Manual* (18th Ed), American Public health Association, Washington DC.
- 80 Australian Government, June 2006, *Interim Infection Control Guidelines for Pandemic Influenza in Healthcare and Community Settings*, Canberra.
- 81 Centers for Disease Control and Prevention, 1996, *Guidelines for Isolation Precautions in Hospitals* http://www.cdc.gov/ncidod/dhqp/gl_isolation.html

