Infection Control: Summary of NHMRC Guidelines for Osteopaths

Background
The Osteopathy Board of Australia, in its *Guidelines for Infection Control*, has adopted the National Health and Medical Research Council (2010) *Australian Guidelines for the Prevention and Control of Infection in Healthcare,* Commonwealth of Australia (the NHMRC Guidelines). The NHMRC Guidelines are found at:
http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/cd33_complete.pdf

The NHMRC Guidelines are considered by the Osteopathy Board to illustrate the standards for all health care workers in Australia and as such, osteopathic practitioners should ensure they are familiar with all aspects of the Guidelines as they provide recommendations that outline the critical aspects of infection prevention and control.

When the Osteopathy Board undertook public consultations, a number of questions were raised. The Board has developed a FAQ sheet on Infection Control which is found at the Board's FAQ webpage on: http://www.osteopathyboard.gov.au/Registration-Standards/FAQ.aspx

To assist osteopaths to adhere to the Board's *Guidelines for Infection Control*, the Board has compiled sections of the NHMRC Guidelines it considers to be of most relevance and importance to osteopaths. Practitioners are advised to read this summary in conjunction with the full NHMRC document to ensure a thorough understanding of the standards expected of all osteopaths.

This Supplementary Paper represents material taken directly from the NHMRC Guidelines and some additional comments for osteopathic practice as shaded text. The intention here is to highlight office-based infection control, which is more relevant for osteopathic practice. The NHMRC has granted permission to use the material in this Supplementary Paper.

Introduction
The NHMRC guidelines were developed to establish a nationally accepted approach to infection prevention and control, focusing on core principles and priority areas for action. They provide a basis for healthcare workers and healthcare facilities to develop detailed protocols and processes for infection prevention and control specific to local settings.

When implementing these recommendations all healthcare facilities need to consider the risk of transmission of infection and implement according to their specific setting and circumstances. It is recognised that the level of risk may differ according to the different types of facility and therefore some recommendations should be justified by risk assessment.

Effective infection prevention and control is central to providing high quality health care for patients and a safe working environment for those that work in healthcare settings. Healthcare-associated infection is preventable.

Healthcare-associated infection (HAI) does not just affect patients and workers in hospitals — HAIs can occur in any healthcare setting, including office-based practices (e.g. osteopathic clinics). Any person working in or entering a healthcare facility is at risk. However, healthcare-associated infection is a potentially preventable adverse event rather than an unpredictable complication. It is possible to significantly reduce the rate of HAIs through effective infection prevention and control.

By assisting healthcare workers to improve the quality of the care they deliver, these guidelines aim to promote and facilitate the overall goal of infection prevention and control:

> *The creation of safe healthcare environments through the implementation of practices that minimise the risk of transmission of infectious agents.*

This approach is underpinned by a risk-management framework to ensure the basic principles of infection prevention and control can be applied to a wide range of healthcare settings including office-based practice.

The evidence base for the guidelines addresses the highest level of risk of infection transmission in the healthcare setting, and has predominantly been drawn from the acute-care setting. However, case studies giving examples of risk assessments have been included within the Guidelines to help illustrate how these recommendations can be applied to other settings.

Supporting documents have been developed for healthcare workers, patients and health facility managers to assist with implementation of the guidelines. These materials will be available on the NHMRC website.

The guidelines are for use by all those working in healthcare—this includes healthcare workers, management and support staff.

Given that there is limited evidence available to support many routine practices intended to reduce infection risk, practice is based on decisions made on scientific principles. Some activities, such as performing hand hygiene between administering care to successive patients, have a credible history to support their routine application in preventing cross-infection. Others, such as some uniform and clothing requirements, have more to do with the ethos of quality care and workplace culture than with a proven reduction of cross-infection.

Structure of the guidelines:

The guidelines are based around the following core principles:

- an understanding of the modes of transmission of infectious agents and of risk management
- effective work practices that minimise the risk of transmission of infectious agents
- governance structures that support the implementation, monitoring and reporting of infection prevention and control work practices
- compliance with legislation, regulations and standards relevant to infection control.

Part A presents background information that should be read by everyone working in health care. It includes important basics of infection prevention and control, such as the main modes of transmission of infectious agents and the application of risk-management principles. This part of the guidelines does not include recommendations.

Part B is specific to the practice of healthcare workers and support staff, and outlines effective work practices that minimise the risk of transmission of infectious agents. Recommendations are given in Sections B1 to B3. Each section includes advice on putting the recommendations into practice, a risk-management case study and resources.

Section B1 describes standard precautions used at all times to minimise the risk of transmission of infectious agents.

Section B2 outlines transmission-based precautions to guide staff in the presence of suspected or known infectious agents that represent an increased risk of transmission.

Section B3 outlines approaches to the management of multi-resistant organisms (MROs) or outbreak situations.

Section B4 outlines processes for risk identification and the application of standard and transmission-based precautions for certain procedures.

Section B5 includes supplementary information to assist in the application of standard and transmission-based precautions.

Part C describes the responsibilities of management of healthcare facilities, including governance structures that support the implementation, monitoring and reporting of effective work practices.

The chapters outline the main components of a systems approach to facility-wide infection prevention and control, giving guidance on management and staff responsibilities, protection of healthcare workers, requirements for education and training of all staff, considerations for facility design and renovation, and other important activities such as surveillance and antibiotic stewardship.

Part A

If effectively implemented, the two-tiered approach of standard and transmission-based precautions recommended in these guidelines provides high-level protection to patients, healthcare workers and other people in healthcare settings.

Infection prevention and control is integral to clinical care and the way in which it is provided. It is not an additional set of practices.

Section A1

In healthcare settings, the main modes for transmission of infectious agents are contact (including blood borne), droplet and airborne.

Infectious agents transmitted during health care come primarily from human sources, including patients, healthcare workers and visitors. Source individuals may be actively ill, may have no symptoms but be in the incubation period of a disease, or may be temporary or chronic carriers of an infectious agent with or without symptoms.

In healthcare settings, the most common susceptible hosts are patients and healthcare workers.

A1.2 Standard and transmission-based precautions

Successful infection prevention and control involves implementing work practices that prevent the transmission of infectious agents through a two-tiered approach including:

- routinely applying basic infection prevention and control strategies to minimise risk to both patients and healthcare workers, such as hand hygiene, personal protective equipment, cleaning and appropriate handling and disposal of sharps (*standard precautions*)
- effectively managing infectious agents where standard precautions may not be sufficient on their own—these specific interventions control infection by interrupting the mode of transmission *(transmission-based precautions*; formerly referred to as *additional precautions*).

If successfully implemented, standard and transmission-based precautions prevent any type of infectious agent from being transmitted.

Standard precautions refer to those work practices that are applied to everyone, regardless of their perceived or confirmed infectious status and ensure a basic level of infection prevention and control. Implementing standard precautions as a first-line approach to infection prevention and control in the healthcare environment minimises the risk of transmission of infectious agents from person to person, even in high-risk situations.

Standard precautions are used by healthcare workers to prevent or reduce the likelihood of transmission of infectious agents from one person or place to another, and to render and maintain objects and areas as free as possible from infectious agents. Guidance on implementing standard precautions is given in Sections B1 and B5.

Transmission-based precautions are recommended as extra work practices in situations where standard precautions alone may be insufficient to prevent transmission. Transmission-based precautions are also used in the event of an outbreak (e.g. gastroenteritis), to assist in containing the outbreak and preventing further infection.

Transmission-based precautions should be tailored to the particular infectious agent involved and its mode of transmission. This may involve a combination of practices.

Guidance on when and how to implement transmission-based precautions is given in Sections B2, B3 and B5.

A2 Overview of risk management in infection prevention and control

Adopting a risk-management approach at all levels of the facility is necessary. This task requires the full support of the facility's management as well as cooperation between management, healthcare workers and support staff.

Differing types and levels of risk exist in different healthcare settings. In developing local policies and procedures, each healthcare facility should conduct its own risk assessment (i.e. how to avoid, identify, analyse, evaluate and treat risks in that setting), and also refer to discipline-specific guidance where relevant.

Risk management is the basis for preventing and reducing harms arising from healthcare-associated infection.

As healthcare settings differ greatly in their day-to-day function, it is not possible to provide a one size fits all approach to risk management. Even within a single setting (e.g. primary care), increasingly complex care is delivered by a range of health professionals with diverse qualifications and training. All healthcare facilities need to be able to determine the risks in their own context and select the appropriate course of action. Therefore it is necessary for facilities to regularly conduct infection prevention risk assessments within their facility and ensure that all staff understand their responsibility in managing these risks.

A two-way approach that encourages patient participation is essential to successful infection prevention and control.

Patient-centred care cannot just be 'added on' to usual care. The rights, experiences and views of patients should be at the centre of the care process and drive the way in which care is delivered. In most healthcare facilities, a significant culture change is necessary to embed patient-centred care principles into the philosophy and practices of the organisation. Healthcare workers and organisations need to acknowledge and understand the Charter of Healthcare Rights and work to ensure that patients' rights are integral to the care process.

Part B Standard and transmission-based precautions

The use of standard precautions is the primary strategy for minimising the transmission of healthcare-associated infections.

Transmission-based precautions are used in addition to standard precautions, where the suspected or confirmed presence of infectious agents represents an increased risk of transmission.

Standard precautions consist of:

- hand hygiene, before and after every episode of patient contact
- the use of personal protective equipment
- the safe use and disposal of sharps
- routine environmental cleaning
- reprocessing of reusable medical equipment and instruments
- respiratory hygiene and cough etiquette
- aseptic non-touch technique
- waste management
- appropriate handling of linen

Hand hygiene using alcohol-based hand rubs is more effective against the majority of common infectious agents on hands than hand hygiene with plain or antiseptic soap and water.

Reductions in HAIs with the use of alcohol-based hand rubs have been associated with products that contain at least 70% alcohol (isopropanol), 0.5% chlorhexidine and a skin emollient (Grayson et al 2009).

Plain soaps act by mechanical removal of microorganisms and have no antimicrobial activity. They are sufficient for general social contact and for cleansing of visibly soiled hands.

There is a tendency for antimicrobial soaps to be more effective than plain soaps, although the evidence around this is inconsistent. Antimicrobial soap is associated with skin care issues and it is not necessary for use in everyday clinical practice (Pratt et al 2001; Boyce & Pittet 2002; Pratt et al 2007.)

Neutral hand-wipe products may be considered in instances where hygienic access to soap and water is not readily available, such as in community care settings. Alcohol-based hand rubs are also suitable for use in resource-limited or remote areas with lack of accessibility to sinks or other facilities for hand hygiene (including clean water, towels etc.).

The Osteopathy Board of Australia recommends a minimum standard of the use of soap and water between patients. In circumstances where there is an increased risk of infection transmission, alcohol-based hand rubs should be employed.

Effective hand hygiene relies on appropriate technique as much as on selection of the correct product. Inappropriate technique can lead to failure of hand hygiene measures to effectively remove or kill microorganisms on hands, despite the superficial appearance of having complied with hand hygiene requirements.

To reduce the risk of cross-transmission of infectious agents, cuts and abrasions should be covered with waterproof dressings.

The type and length of fingernails can have an impact on the effectiveness of hand hygiene (Boyce & Pittet 2002; Lin et al 2003). Artificial or false nails have been associated with higher levels of infectious agents, especially Gram-negative bacilli and yeasts, than natural nails (Pottinger et al 1989; Passaro et al 1997; Foca et al 2000; Hedderwick et al 2000; Moolenaar et al 2000; Parry et al 2001; Boyce & Pittet 2002; Gupta et al 2004; Boszczowski et al 2005). Fingernails should therefore be kept short (e.g. the length of the finger pad) and clean, and artificial fingernails should not be worn. Studies have also demonstrated that chipped nail polish may support the growth of organisms on the fingernails (Grayson et al 2009). It is good practice to not wear nail polish, but if it must be used it should not be chipped and should be removed every 4 days (AORN 2007).

The consensus recommendation is to strongly discourage the wearing of watches, rings or other jewellery during health care; however if jewellery must be worn in clinical areas it should be limited to a plain band (e.g. wedding ring) and this should be moved about on the finger during hand hygiene practices.

Generally, alcohol-based hand rubs cause significantly less skin reaction or irritation than hand hygiene with plain or antiseptic soaps (Pittet & Boyce 2001).

B1.2 Personal protective equipment

Personal protective equipment (PPE) refers to a variety of barriers, used alone or in combination, to protect mucous membranes, airways, skin and clothing from contact with infectious agents.

PPE used as part of standard precautions includes aprons, gowns, gloves, surgical masks, protective eyewear and face shields. Selection of PPE is based on the type of patient interaction, known or possible infectious agents, and/or the likely mode(s) of transmission.

Selection of protective equipment must be based on assessment of the risk of transmission of infectious agents to the patient or carer, and the risk of contamination of the clothing or skin of healthcare workers or other staff by patients' blood, body substances, secretions or excretions.

B1.2.3 Aprons and gowns

International guidelines recommend that protective clothing (apron or gown) be worn by all healthcare workers when (Garner 1996; Pratt et al 2001; Clark et al 2002; Pratt et al 2007):

- close contact with the patient, materials or equipment may lead to contamination of skin, uniforms or other clothing with infectious agents
- there is a risk of contamination with blood, body substances, secretions or excretions (except sweat).

Clinical and laboratory coats or jackets worn over personal clothing for comfort and/or purposes of identity are not considered to be PPE. These items of clothing need to be changed dependant on activity and the extent of exposure to potential pathogens.

B1.2.5 Gloves

Gloves can protect both patients and healthcare workers from exposure to infectious agents that may be carried on hands (Duckro et al 2005). As part of standard precautions, they are used to prevent contamination of healthcare workers' hands when (Siegel et al 2007):

- anticipating direct contact with blood or body substances, mucous membranes, non-intact skin and other potentially infectious material
- handling or touching visibly or potentially contaminated patient-care equipment and environmental surfaces (Boyce & Pittet 2002; Bhalla et al 2004; Duckro et al 2005).

As with all PPE, the need for gloves is based on careful assessment of the task to be carried out, the related risk of transmission of microorganisms to the patient; and the risk of contamination of the healthcare worker's clothing and skin by the patient's blood and body substances (Pratt et al 2001; Clark et al 2002).

Gloves must be worn as a single-use item for:

- each invasive procedure;
- contact with sterile sites and non-intact skin or mucous membranes; and
- activity that has been assessed as carrying a risk of exposure to blood, body substances, secretions and excretions.

Gloves must be changed between patients and after every episode of individual patient care.

Natural rubber latex (NRL) remains the material of choice for gloves due to its efficacy in protecting against bloodborne viruses and properties that enable the wearer to maintain dexterity (Pratt et al 2001; Clark et al 2002). However, sensitivity to NRL in patients, carers and healthcare workers may occur and must be documented.

When removing gloves, care should be taken not to contaminate the hands. After gloves have been removed, hand hygiene should be performed in case infectious agents have penetrated through unrecognised tears or have contaminated the hands during glove removal (Olsen et al 1993; Tenorio et al 2001; Boyce & Pittet 2002).

Gloves must not be washed for subsequent re-use—infectious agents cannot be removed reliably from glove surfaces and continued glove integrity cannot be ensured. Glove re-use has been associated with transmission of methicillin-resistant *Staphylococcus aureus* (MRSA) and Gramnegative bacilli (Doebbeling et al 1988; Maki et al 1990; Olsen et al 1993).

Gloves should be disposed of as soon as they are removed, with disposal complying with local policies and standards.

B1.2.6 Other items of clothing

There is some evidence to suggest that lanyards and neckties may play a role in transmission of infection but it is difficult to demonstrate the precise role (Kotsanas et al 2008).

Uniforms should be washed daily. There is no evidence to suggest that home laundering is inferior to commercial reprocessing of uniforms (Loveday et al 2007).

B1.3 Handling and disposing of sharps

B1.3.1 What are the risks?

The use of sharp devices exposes healthcare workers to the risk of injury and potential exposure to bloodborne infectious agents, including hepatitis B virus, hepatitis C virus and human immunodeficiency virus (HIV) (CDC 2001; Do et al 2003).

Sharps injuries can occur in any healthcare setting, including non-hospital settings such as in office based practices. Injuries most often occur (CDC 2008):

- during use of a sharp device on a patient (41%);
- after use and before disposal of a sharp device (40%); and
- during or after appropriate or inappropriate disposal of sharp devices (15%).

There are many possible mechanisms of injury during each of these periods.

B1.3.2 Handling of sharps

All healthcare workers should take precautions to prevent injuries caused by needles, scalpels and other sharp instruments or devices: during procedures; when cleaning used instruments; during disposal of used needles;

Standard measures to avoid sharps injuries include handling sharp devices in a way that prevents injury to the user and to others who may encounter the device during or after a procedure. Examples include (CDC 2008):

- giving verbal announcements when passing sharps
- avoiding hand-to-hand passage of sharp instruments by using a basin or neutral zone.

Sharps must not be passed directly from hand to hand and handling should be kept to a minimum. Needles must not be recapped, bent or broken after use.

B1.3.3 Disposal of single-use sharps

Any person who has used a disposable sharp instrument or equipment must be responsible for its safe management and immediate disposal after use.

After they are used, single-use syringes and needles, scalpel blades and other sharp items should be placed in an appropriate container. These containers should be clearly labelled, puncture and leak proof, and conform to AS4031 or AS/NZ 4261. The containers should be located at the point of use. Reusable sharps requiring transport to a reprocessing area must be placed in a puncture-resistant lidded container. Sharps containers must be appropriately placed so that they are out of reach of children. They should also be placed in a secure position or mounted on the wall to prevent tipping.

If a sharps injury happens to you, you can be reassured that only a small proportion of accidental exposures result in infection. Taking immediate action will lower the risk even further.

The person who has used the single-use sharp must be responsible for its immediate safe disposal.

Used disposable sharps must be discarded into an approved sharps container at the point-of-use. These must not be filled above the mark that indicates the bin is three-quarters full.

Before using any sharp medical device such as needles or scalpels, always plan for their safe handling and immediate disposal at the point-of-use

- Make sure every used sharp medical device such as needles, scalpels etc are disposed of properly in puncture resistant sharps containers located at the point-of-use
- Report any needlestick or sharps-related injuries promptly as relevant (e.g. to infection control or occupational health and safety professional, management, insurer) and ensure that you receive appropriate follow-up care
- Ensure that you are vaccinated against blood-borne viruses such as hepatitis B. Fully consider the ramifications of non-vaccination.
- Participate in education sessions and professional development sessions on handling sharps, as well as those on new safety devices and how to use them.

B1.4 Routine management of the physical environment

B1.4.1 What are the risks?

Infectious agents can be widely found in healthcare settings and there is a body of clinical evidence, derived from case reports and outbreak investigations, suggesting an association between poor environmental hygiene and the transmission of infectious agents in healthcare settings (Garner & Favero 1986; Dancer 1999). Transmission of infectious agents from the environment to patients may occur through direct contact with contaminated equipment, or indirectly, for example, in the acute-care setting, via hands that are in contact with contaminated equipment or the environment and then touch a patient (Dancer 2008).

Environmental surfaces can be safely decontaminated using less rigorous methods than those used on medical instruments and devices. The level of cleaning required depends on the objects involved and the risk of contamination—for example, surfaces that are likely to be contaminated with infectious agents (e.g. shared clinical equipment) require cleaning between patient uses, which is more often than general surfaces and fittings. However, all surfaces require regular cleaning. Thorough cleaning of all surfaces is necessary after spills and between patient uses of a room or patient-care area, especially in acute-care settings.

B1.4.2 Routine environmental cleaning

General surfaces can be divided into two groups—those with minimal hand contact (e.g. floors and ceilings) and those with frequent skin contact ('frequently touched' or 'high risk' surfaces). The methods, thoroughness and frequency of cleaning and the products used are determined by risk analysis and reflected in healthcare facility policy.

Frequently touched surfaces in patient-care areas should be cleaned using a detergent solution and more frequently than surfaces with minimal hand contact. Infection control professionals typically use a risk-assessment approach to identify frequently touched surfaces and then coordinate an appropriately thorough cleaning strategy and schedule with the housekeeping staff.

The recommendations outlined for cleaning should be justified by the risk of transmission of infection within a particular healthcare facility. It is suggested that all organisations should have a documented cleaning schedule that outlines clear responsibilities of staff, a roster of duties and the frequency of cleaning required and the products that should be used to clean specific areas.

The risk of transmission of particular infections should be assessed and the cleaning schedule should be adjusted if a known infectious agent is present (e.g. an outbreak of *C. difficile* requires surfaces to be disinfected with sodium hypochlorite after cleaning with detergent [HPS 2008]).

Most hard surfaces can be adequately cleaned with warm water and detergent as per manufacturers' instructions. Allowing the cleaned surface to dry is an important aspect of cleaning.

Minimal touch surfaces

A detergent solution (diluted as per manufacturer's instructions) is adequate for cleaning general surfaces (e.g. floors, walls), as well as non-patient-care areas (e.g. administrative offices). Damp mopping is preferable to dry mopping for routine cleaning (Andersen et al 2009). Walls and blinds in patient-care areas should be cleaned with detergent solution when they are visibly dusty or soiled. Window curtains should be regularly changed in addition to being cleaned when soiled or exposed to MROs. Sinks and washbasins should be cleaned with a detergent solution on a regular basis as set by facility policy.

Frequently touched surfaces

Surfaces that are in close proximity to the patient and frequently touched surfaces in the patient care areas should be cleaned more frequently than minimal touch surfaces. Examples include doorknobs, light switches, tabletops and wall areas around the toilet.

Frequently touched surfaces can be cleaned with a detergent solution designed for general purpose cleaning. The exact choice of detergent will depend on the nature of the surface and the likely degree

of contamination. Detergent-impregnated wipes may be used to clean single pieces of equipment and small surface areas. This method is not normally used for general ward cleaning and should not be considered a replacement for clean cloths and detergent solution.

Recommendation
Clean frequently touched surfaces, such as treatment tables, with detergent solution at least daily, and when visibly soiled and after every known contamination.

In office-based practice, the risk of contamination, mode of transmission and risk to others should be used to determine whether disinfectants are required.

High-level disinfectants or liquid chemical sterilants are not appropriate for general cleaning; such use is counter to manufacturers' instructions for these hazardous chemicals.

Surface barriers (e.g. clear plastic wrap, bags, sheets, tubing or other materials impervious to moisture) help prevent contamination of surfaces and equipment. Surface barriers on equipment (e.g. computer keyboards) need to be placed carefully to ensure that they protect the surfaces underneath and should be changed or cleaned between patients. If surface barriers are unable to be used, cleaning clinical surfaces including equipment still applies.

Cleaning implements and solutions
Part of the cleaning strategy is to minimise contamination of cleaning solutions and cleaning tools. Proper procedures for effective use of mops, cloths, and solutions should be followed:

- prepare cleaning solutions daily or as needed, and replace with fresh solution frequently,
- clean mops and cloths after use and allow to dry before reuse, or use single-use mop heads and cloths.

Carpet
Carpets in public areas and in general patient-care areas should be vacuumed regularly with well maintained equipment. Equipment fitted with high efficiency particulate air (HEPA) filters will minimise dust dispersion (see also Section C6.2.3) and while considered ideal, is not considered essential in Osteopathic office-based practice.

After a spill has been removed as much as possible (see Section B1.4.3), the carpet should be cleaned using the hot water extraction method, which is recognised by AS/NZS 3733:1995 to minimise chemical and soil residue.

Carpets should undergo thorough cleaning on a regular basis, using a method that minimises the production of aerosols, leaves little or no residue and is recommended by Australian Standards and manufacturer's recommendations.

B1.4.3 Management of blood and body substance spills
Prompt removal of spots and spills of blood and body substance followed by cleaning and disinfection of the area contaminated is a sound infection control practice.

Strategies for decontaminating spills of blood and other body substances (e.g. vomit, urine) differ based on the setting in which they occur and the volume of the spill. In patient-care areas, healthcare workers can manage small spills by cleaning with detergent solution.

If spillage has occurred on soft furnishings, a detergent solution can be used to clean the area thoroughly. Soft furnishings can also be wet vacuumed. Following cleaning of soft furnishings, every effort must be made to air the room to allow drying of the furnishing before reuse.

Alcohol solutions should not be used to clean spillages (HPS 2006).

B1.5 Reprocessing of reusable instruments and equipment

Any instrument or piece of equipment that is to be reused requires reprocessing—cleaning, disinfection and/or sterilisation. The minimum level of reprocessing required for reusable instruments

and equipment depends on the individual situation (i.e. the body site and the nature by which the instrument will be used).

Semi-critical
These items come into contact with mucous membranes or non-intact skin, and should be single use or sterilised after each use. If this is not possible, high-level disinfection is the minimum level of reprocessing that is acceptable.

Non-critical
These items come into contact with intact skin but not mucous membranes. Thorough cleaning is sufficient for most non-critical items after each individual use, although either intermediate or low-level disinfection may be appropriate in specific circumstances.

Instruments should be cleaned as soon as practical after use (e.g. preferably at the point of use).

The cleaning solution and style must be appropriate for each instrument and equipment. The manufacturer's instructions will guide the type of cleaning agent required. This is usually neutral pH or mildly alkaline as such solutions generally provide the best material compatibility profile and good soil removal and mildly acidic solutions may damage instruments.

B1.5.6 Storage and maintenance
Equipment and instrument surfaces should be regularly examined for breaks in integrity that would impair either cleaning or disinfection/sterilisation. Equipment that no longer functions as intended or cannot be properly cleaned and disinfected or sterilised should be repaired or discarded.

Any instrument that goes inside the nose, mouth or other orifice, or touches broken skin, is either sterilised or disinfected to a high level.

Any equipment that touches the patient or is touched by the patient, is cleaned thoroughly and if necessary disinfected.

B1.6 Respiratory hygiene and cough etiquette

Respiratory hygiene and cough etiquette should be applied as a standard infection control precaution at all times. Covering sneezes and coughs prevents infected persons from dispersing respiratory secretions into the air. Hands should be washed with soap and water after coughing, sneezing, using tissues, or after contact with respiratory secretions or objects contaminated by these secretions.

Anyone with signs and symptoms of a respiratory infection, regardless of the cause, should follow or be instructed to follow respiratory hygiene and cough etiquette as follows:

- Cover the nose/mouth with disposable single-use tissues when coughing, sneezing, wiping and blowing noses
- Use tissues to contain respiratory secretions
- Dispose of tissues in the nearest waste receptacle or bin after use
- If no tissues are available, cough or sneeze into the inner elbow rather than the hand
- Practice hand hygiene after contact with respiratory secretions and contaminated objects/materials
- Keep contaminated hands away from the mucous membranes of the eyes and nose

Health care/social workers should also assist patients (e.g. elderly, children) who need assistance with containment of respiratory secretions. Those who are immobile will need a receptacle (e.g. plastic bag) readily at hand for the immediate disposal of used tissues and will need to be offered hand hygiene facilities.

B1.8 Waste management

As there is currently no national definition of clinical waste in Australian, healthcare facilities need to conform to relevant State or Territory legislation and regulations on the management of clinical and related wastes. Healthcare facilities should also refer to AS/NZS 3816.

When handling waste:

- apply standard precautions to protect against exposure to blood and body substances during handling of waste; wash hands following procedure
- segregation should occur at the point of generation
- waste should be contained in the appropriate receptacle (identified by colour and label) and disposed of according to the facility waste management plan
- healthcare workers should be trained in the correct procedures for waste handling.

Regardless of where waste is generated (e.g. isolation rooms/patient versus routine patient-care areas), the principles of determining whether it is to be treated as clinical or general waste remain the same.

B1.9 Handling of linen

It is suggested that healthcare facilities should have documented polices on the collection, transport and storage of linen. All used linen should be handled with care to avoid dispersal of microorganisms into the environment and to avoid contact with staff clothing.

While the NHMRC Guidelines suggest that all healthcare facilities that process or launder linen must have documented operating policies consistent with AS/NZS 4146, Osteopaths should apply the following principles when handling linen:

- appropriate PPE is worn during handling of soiled linen to prevent skin and mucous membrane exposure to blood and body substances
- used linen is 'bagged' at the location of use into an appropriate laundry receptacle
- used linen must not be rinsed or sorted in patient-care areas
- linen soiled with body substances should be placed into leak-proof laundry bags for safe transport
- hand hygiene is performed following the handling of used linen.

Clean linen must be stored in a clean dry place that prevents contamination by aerosols, dust, moisture and vermin and is separate from used linen.

Washing must involve the use of an appropriate detergent and hot water.

Used linen may be washed in domestic washing machine in separate loads to other domestic washing. If hot water is not available, only individual patient loads should be washed at one time.

It is recommended that clothes dryers should be used for drying.

B2.1.2 When are transmission-based precautions applied?

Transmission-based precautions are applied to patients suspected or confirmed to be infected with agents transmitted by the contact, droplet or airborne routes. The combination of measures used in transmission-based precautions depends on the route(s) of transmission of the infectious agent involved, as outlined in Sections B2.2, B2.3 and B2.4.

Considering the following will help to establish the risk of infection in primary care and officebased practice:

- patient population—this will influence the nature of care required and the type of potential infectious agents (e.g. some populations have a higher incidence of tuberculosis)
- the profile of care—this includes the level of training of staff, what forms of invasive procedures are performed, whether equipment is reprocessed or single use
- local infrastructure—this influences water quality, food availability, access to other health services (i.e. rural vs urban).

B4 Applying standard and transmission-based precautions during procedures

Medical and dental procedures increase the risk of transmission of infectious agents between patients and healthcare workers.

- ‘Procedure’ includes any situation in which there is a potential for contact between the skin of the healthcare worker and the patient’s tissues, body cavities or organs, either directly or via surgical instruments or therapeutic devices.
- The more invasive the procedure, the greater the risk of transmission of infection. Before a procedure is undertaken, consideration should be given to whether there is a safer, less invasive alternative.
- The level of perceived infection risk depends on a range of factors including the site and complexity of the procedure and patient characteristics (e.g. age, underlying illness).
- Healthcare workers should be trained and competent in safe procedural techniques and participate in regular education sessions about minimising the infection risk of procedures. If there is any uncertainty, healthcare workers should contact the person with designated responsibility for infection control.

B4.1 Taking a risk-management approach to procedures

All procedures involve some risk of infection. Minimising the infection risk associated with a procedure should be an integral part of considering the overall risks and benefits of that procedure to the patient. The aim should be to perform the procedure with the lowest level of perceived infection risk that will meet the treatment goals for that patient. When performing the procedure, associated infection risks should be identified and minimised.

Appropriate use of devices is integral to reducing the risk of procedures. Single-use or single patient items should be used wherever practical, and items designed for single use must not be used for multiple patients. Healthcare workers should be aware of situations where cross contamination may occur during routine procedures.

B5.1 Recommended routine cleaning frequencies for clinical, patient and resident areas in acute settings

The following table outlines the recommended minimum frequencies for routine cleaning of various items in healthcare facilities. It is applicable to all settings (although some items may not be relevant to all settings) and is presented by level of risk as per the key below. The table has been developed to provide a benchmark guide to best-practice cleaning schedules. Facilities should develop and implement a local cleaning schedule and policy that suits their environment,

For low risk rehabilitation, long-term care, or office based environments:

1. Medical surface detergent or a detergent wipe that is registered as a Class I Medical Device with the TGA (for cleaning of surfaces and frequently touched objects in clinical, patient and resident areas). This detergent or detergent wipe should be recommended with clear instructions in regards to materials compatibility.
2. Where transmission-based precautions are required, a TGA-registered hospital grade disinfectant must be used if a disinfectant is required. The disinfectant chosen should have label claims against the organism of concern.

Part C Organisational support

Infection control is a health and safety issue, which means that all those working in the healthcare facility—managers, healthcare workers and support staff —are responsible for providing a safe environment for patients and other staff.

All healthcare workers need to be aware of their individual responsibility for maintaining a safe care environment for patients and other staff.

C1.2.4 Infection prevention and control processes in office-based practice

In office–based practice, the processes associated with infection prevention and control will differ although the responsibilities are the same. The principal of the practice is equivalent to the CEO; he or she has overall responsibility for infection prevention and control in the practice and should demonstrate a strong commitment to an agreed infection prevention and control plan based on the identified risks for that practice. Local policies and procedures need to be developed and implemented as part of standard operating procedures. A nominated staff member should take on the role of infection control professional, developing infection prevention and control procedures and overseeing their implementation. This staff member is likely to need additional training and perhaps ongoing external support in managing infection prevention and control issues. Infection prevention and control should be considered regularly, with discussion of procedures and processes of the practice and any problem areas.

C1.4.1 Organisational support for risk management

For risk management within an organisation to be effective there needs to be appropriate infrastructure and culture; a logical and systematic approach to implementing the required steps (outlined in C1.4.2); and embedding of risk-management principles into the philosophy, practices and business processes of an organisation, rather than it being separate activity or focus.

C2 Staff health and safety

Infection protection for healthcare workers should be an integral part of the infection prevention and control and occupational health and safety programs of every healthcare facility.

• This includes implementing a staff health screening policy, promoting education on immunisation, instituting extra protection for healthcare workers in specific circumstances (e.g. pregnant healthcare workers), and having processes for minimising and managing risk exposure.

To ensure the safety of everyone in the facility, both employers and employees have a responsibility in relation to infection prevention and control and occupational health and safety.

Healthcare worker's privacy and civil rights must always be respected and not breached.

C2.1.2 Responsibilities of healthcare workers

Healthcare workers have an obligation to always follow specific established infection prevention and control policies as part of their contract of employment. This includes reporting their infectious status if it places others at risk as well as any known potential exposures to blood and/or body substances. Failure to follow infection prevention and control policies and procedures may be grounds for disciplinary action. Some states/territories have statutory infection prevention and control requirements for healthcare workers.

Healthcare workers with infections should seek appropriate medical care from a doctor qualified to manage their condition. Where there is a risk of a healthcare worker transmitting infection to a patient or other healthcare worker (e.g. if he or she is infected with an acute or other transmissible infection, carries a blood borne virus, or has a predisposing skin condition), the healthcare worker should be counselled about work options and either rostered appropriately or provided with equipment, information and facilities to enable him or her to perform their duties without placing others at risk.

The appropriate work option will depend on the specific circumstances:

• healthcare workers with symptoms of acute infections (e.g. vomiting, diarrhoea, flu symptoms) should not come to work for the specified exclusion period (see Section C2.3)

• healthcare workers who carry a bloodborne virus (e.g. hepatitis B, hepatitis C, HIV) may need to accept that their duties may be modified if they perform exposure-prone procedures that pose a potential risk to patients and other staff. In some jurisdictions, healthcare workers who carry a bloodborne virus are legally obliged to declare their infectious status.

Healthcare workers should be aware of their requirements for immunisation against infectious diseases and maintain personal immunisation records.

Education about safe work practices is discussed in Section C3.

Pre-employment screening and immunisation requirements for healthcare workers can be determined using a risk classification system that assesses the exposure to blood and body substances. Work activities, rather than job title, must be considered on an individual basis when determining risk categorisation.

All Category A healthcare workers (see Table C2.1) are required to be able to provide evidence of serological immunity or vaccination history. Acceptable evidence of protection includes a written record of vaccination signed by the provider and/or serological confirmation of protection. This does not include a statutory declaration.

The overarching principle for exclusion periods is that staff members should not come to work if they have signs or symptoms of a potentially infectious disease.

Include Familiarity with exclusion periods Table C2.3 p207:

- Conjunctivitis: Must not provide patient care for the duration of symptoms (i.e. while eye discharge is present).
- Gastroenteritis* (except norovirus): Must not come to work while symptomatic (e.g. diarrhoea and/or vomiting) and until 24 hours after symptoms have resolved
- Glandular fever: NO need for exclusion, even if having direct patient contact, provided staff members are well enough to return to work and employ standard precautions.
- Herpes Simplex (cold sores): Must not provide direct care to neonates, newborns, patients in delivery suites, severely immunocompromised patients, burns patients, patients with extensive eczema, or patients in operating room if there is an exposed herpetic lesion. May provide direct patient care to other patients, do not need to wear a mask
- Herpes Zoster (Shingles): Must not provide ANY direct patient care if lesions cannot be covered (e.g. ophthalmic zoster). If active lesions can be covered, can provide care to all patients except for pregnant women, neonates, severely immunocompromised patients, burns patients and patients with extensive eczema.
- Influenza: Employees should remain off work for 5–6 days or until they are symptom free
- Norovirus: Must not come to work while symptomatic (e.g. diarrhoea and/or vomiting) and until 48 hours after symptoms have resolved (see GPP below)
- Pertussis (Whooping Cough): Remain away from work until at least 5 days after commencement of appropriate antibiotic therapy; or for 21 days after the onset of symptoms if not receiving antibiotic treatment.
- Scabies and Lice: Remain off work until 1st treatment has been completed.
- Staphylococcal infection: Any staphylococcal lesions (e.g. boils, wound infections) must be covered with an occlusive dressing while at work. If lesions cannot be covered, must not perform patient care or prepare hospital food until they have received appropriate antibiotic therapy and the infection has resolved

C2.4.1 Pregnant healthcare workers

Employers should provide information on the risks associated with pregnancy and should assist pregnant healthcare workers to avoid infectious circumstances that may present a risk to her or the baby. It is the responsibility of pregnant healthcare workers to advise their doctor and employer of their pregnancy; this information must remain confidential.

All pregnant healthcare workers should adhere to standard and transmission-based precautions and ensure that they have considered appropriate vaccinations.

Pregnant healthcare workers should be given the opportunity to avoid patients with specific infections.

C2.4.2 Immunocompromised healthcare workers

Healthcare workers with immune deficiencies are more at risk of acquiring infections. The type of employment they can undertake should include only duties that will minimise their exposure to infections. Predisposing conditions include neutropenia, disseminated malignancy and infections that produce immunodeficiency (e.g. HIV).

C2.4.3 Healthcare workers with skin conditions

Skin integrity is the ultimate barrier to transmission of infectious agents. When staff members have damaged skin or weeping skin conditions (e.g. allergic eczema, psoriasis, exfoliating dermatitis), they may be readily colonised by healthcare associated microorganisms and may become a vehicle for disseminating these organisms.

Healthcare workers in this situation should be identified by personal history screening when they start employment, and need to be informed of the risks they may pose to patients. Any damaged skin must be appropriately covered before healthcare workers carry out procedures. Consideration must be given to providing these staff members with appropriate, individual PPE such as specific types of gloves, hand hygiene product and moisturising lotion.

Healthcare workers who carry a bloodborne virus have a clear responsibility to follow the treatment recommended by their doctor and modify their involvement in direct patient care.

C2.6.2 Managing risk of exposure

Exposures that might place a healthcare worker at risk of hepatitis B virus, hepatitis C virus, HIV or human T-cell lymphotropic virus type I (HTLV-I) are percutaneous injury (e.g. needlestick or cut with a sharp object) or contact of mucous membrane or non-intact skin (e.g. exposed skin that is chapped, abraded, or affected by dermatitis) with blood, tissue or other potentially infectious body substances.

Each healthcare facility should have a policy on the management of needlestick injuries, and on providing immediate post-exposure advice for sharps injuries and other blood or body substance incidents involving healthcare workers, as generic policies may not be relevant to individual settings (e.g. access to care, especially after hours).

C3.4 Example of education in practice—hand hygiene

Hand hygiene is the most important of the infection prevention and control strategies. According to the *Hand Hygiene Australia Manual*, healthcare workers must perform hand hygiene before and after every patient contact to prevent patients becoming colonised with pathogens from other patients and the healthcare facility environment. Emphasis must also be placed on preventing the transfer of organisms from a contaminated body site to a clean body site during patient care. The latest guidelines also recommend hand hygiene after contact with inanimate objects, including medical charts and equipment in the immediate vicinity of the patient.

C3.5 Patient engagement

Informing patients and carers about infection prevention strategies and taking their experience and feedback into account are pivotal to safe and effective clinical care. Patient engagement is not just about giving information, it is a process of informing, listening and interacting that gives patients the skills and knowledge to be actively involved in their own health care, give feedback and participate in quality improvement activities.

Through open, respectful interactions with healthcare workers, patients and carers can be given information and support to ensure that they are able to maintain a safe environment in which they receive their care (e.g. information on caring for wounds, basic advice on hand hygiene and spread of infection).

C4.6.1 Notifiable diseases

Notifiable diseases in Australia are listed at:
http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-surveil-nndss-casedefs-distype.htm.

C6.1 Facility design and its impact on infectionprevention and control

Infection prevention and control requirements are critical to the planning of a healthcare facility and need to be incorporated into plans and specifications. All areas of a healthcare facility should be designed, constructed, furnished and equipped to minimise the risk of transmission of infection. In particular, the design and layout of the facility should facilitate the application of standard and transmission-based precautions by all staff.

C6.2.1 Reducing airborne transmission

Reservoirs for airborne pathogens include (Ulrich & Wilson 2006):

- dust (e.g. spores of *C. difficile* or *Aspergillus*)
- aerosols (e.g. TB, severe acute respiratory syndrome [SARS], influenza, chickenpox)
- skin scales shed by patients infected with MRSA.

Most pathogens in healthcare settings originate from patients, staff and visitors within the buildings. Other pathogens can enter buildings from outside air through dust that harbours pathogens such as *Aspergillus*, streptococci or staphylococci (Beggs 2003).

Healthcare workers' hands play a key role in both direct and indirect transmission (see Sections B1.1 and C3.4). Given the importance of maximising hand-hygiene compliance, it is absolutely essential that all areas of the facility are designed to facilitate compliance with hand-hygiene requirements.

Conveniently located alcohol-based product dispensers, sinks and basins can facilitate healthcare worker compliance with hand-hygiene requirements (Grayson et al 2009).

Floor coverings have not been generally related to healthcare associated infection. Some studies have identified carpeting as susceptible to contamination by fungi and bacteria (Anderson et al 1982; Boyce et al 1997; Skoutelis et al 1994; Beyer & Belsito 2000).

When selecting floor covering for a health care setting consideration needs to be given to the following:

- Who is at risk of acquiring infection?
- What is the risk of exposure to the infectious agents?
- What is the nature of the possible infectious agents?
- How can the agent be transmitted? (eg airborne; through cleaning techniques; through contact especially in environments in which there are young children)

In terms of infection prevention and control, the advantages of hard floor coverings include:

- being easier to clean
- being easier to disinfect where required
- allowing use of the most appropriate disinfectant, rather than a product that is suitable for use on carpet
- costing less, as disinfectant is less expensive than steam cleaning, and steam cleaning may not be readily available
- there is less surface area so hard floor coverings are less likely to act a as reservoir of infectious agents than carpet
- when additional cleaning is required, hard floor surfaces are easier to clean than carpet.

However, carpeting may offer advantages unrelated to infection prevention and control, including noise reduction (Philbin & Gray 2002).

The NHMRC Guidelines on Infection Control suggest that textile floor finishes should not be considered unless there is a comprehensive maintenance and replacement program in place complying with AS/NZS 3733. The Osteopathy Board of Australia considers that adherence to this standard is not essential for office-based Osteopathic practice but regular thorough cleaning, maintenance and replacement is expected.

Care and maintenance of floor covering need to consider manufacturer's recommendations.

Carpeting should be avoided in areas where (Sehulster & Chinn 2003):

- spills are likely to occur (e.g. around sinks or in isolation or soiled utility/holding areas)
- patients may have direct contact with contaminated carpets (e.g. children/babies crawling on the floor)
- patients are at greater risk of airborne infections.

Furnishings

Noskin et al (2000) identified fabric-covered furniture as a source of VRE infection in hospitals and suggested the use of easily cleanable, nonporous material.

VRE pathogen survived less well or for shorter periods on vinyl (Lankford et al 2006).

Blinds and curtains should be easy to clean and discourage the accumulation of dust.