AUSTRALIAN COMMISSION
ON SAFETY AND QUALITY IN HEALTH CARE

FACTSHEET
for health service organisations

Using the hierarchy of controls in conjunction with infection prevention and control systems to identify and manage infection risks

Requirements of the National Safety and Quality Health Service Standards

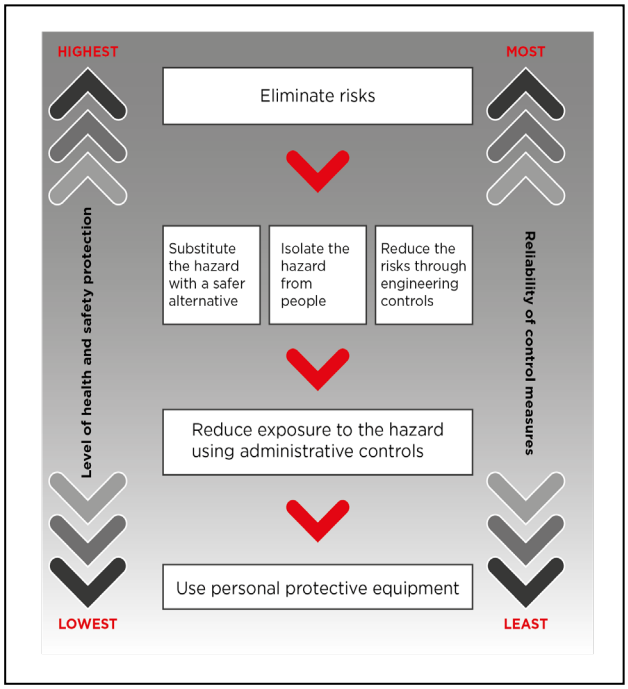
The National Safety and Quality Health Service (NSQHS) Standards require health service organisations to have systems to prevent, manage and control infections and reduce harm for patients, consumers and members of the workforce; and achieve good health outcomes for patients.

The NSQHS Preventing and Controlling Infections Standard requires health service organisations to use evidence-based systems to reduce the risk of infection using the hierarchy of controls in conjunction with infection prevention and control (IPC) systems. Infection prevention and control programs, and the fundamental two-tiered approach to infection and prevention and control, which involves the use of standard and transmission-based precautions, are essential elements of these systems.

What is the hierarchy of controls?

The hierarchy of controls is a model used in work health and safety management (Figure 1) to control hazards that ranks controls from most to least reliable. If it is not reasonably practical to eliminate risks, then risks must be minimised, as far as is reasonably practicable, by using one or a combination of substitution, isolation, or engineering controls, followed by administrative controls and personal protective equipment (PPE).

Figure 1: The hierarchy of controls



Source: Safe Work Australia

An overview of risk management

Risk management is the design and implementation of a program and systems to identify and avoid, or minimise, risks to patients, employees, volunteers, visitors and the organisation. It is a four-step process that is ongoing and proactive.

The key steps for risk assessment and management are:

1. **Identify hazards** – What are the real or potential hazards that could cause harm in the organisation?
2. **Assess risks** – What are the risks if someone is exposed to these hazards, and how likely is it that someone could be exposed to a hazard in the organisation?
3. **Control risks** – What actions can be taken to control the risk?
4. **Review control measures** – How effective are the controls that are in place, and how can they be modified as required, to ensure the ongoing safety of everyone?

Actions 1.10 and 3.01b of the NSQHS Standards require the health service organisation's workforce to use the safety and quality systems from the Clinical Governance Standard to manage risks associated with infections. Health service organisations must:

- Identify and document organisational risks
- Use clinical and other data collections to support risk assessments
- Act to reduce risks
- Regularly review and act to improve the effectiveness of the risk management system
- Report on risks to the workforce and consumers
- Plan for, and manage, internal and external emergencies and disasters.

Using a risk management approach provides health service organisations with a framework to assess and address risks and develop mitigation strategies. Health service organisations need to assess the risks associated with health service delivery actions, and develop a plan that prioritises actions based on the findings of the risk assessment.

Risk management for infection prevention and control

Risk management is intrinsic to IPC systems and practice.

In the IPC context:

- A hazard may be infectious agents that can colonise patients, healthcare workers or visitors, or that can contaminate an environmental surface
- The risks include, but are not limited to, healthcare-associated infections (HAI), occupational exposures and sharps injuries
- Controls to minimise the risk of infection include the elements of standard and transmission-based precautions.

Each IPC program should incorporate processes for the assessment of infection risks, and processes to apply standard and transmission-based precautions that are consistent with the current edition of the Australian Guidelines for the Prevention and Control of Infection in Healthcare. These processes should consider the range of different risks, and opportunities, for the transmission of infectious agents using locally tailored risk assessment questions relating to patients, healthcare workers, the environment, equipment, delivery of care, and visitors and carers. **Table 1** includes some examples of risk assessment questions based on Action 3.07b of the NSQHS Standards.

Health service organisations should use information from local infection surveillance programs to establish baseline data and identify changes in local disease epidemiology and infection risks. Surveillance data should also be used to measure the short- and long-term effectiveness of infection prevention and control strategies. Examples of strategies that could be implemented to minimise infection risks are provided in **Table 2**.

To determine the appropriate risk management approach for your health service organisation, contact your state or territory health department for information on the recommended risk assessment and management framework (i.e. what can be done, and what is possible in the circumstances, to ensure health and safety and continuity of health service delivery).

Table 1: Examples of IPC risk considerations and risk assessment questions*

Example infection risk considerations*	Example infection prevention and control risk assessment questions*
Patients are potentially at risk of acquiring an infection and could be an infection risk to others	• What is the patient's history, including underlying health conditions (e.g. recent surgery overseas, immunosuppression, antimicrobial therapy)? • Does the patient have symptoms that suggest they may have an infection (e.g. cough, fever, rash, infected wounds)? • Are other patients, healthcare workers, or visitors at risk of infection? Consider likelihood of exposure for immunosuppressed patients, pregnant women, young children, elderly, or other susceptible people. • Is the patient likely to undergo an invasive procedure? Where will this occur (e.g. is the patient booked for surgery or being treated in the emergency department)? • Are there processes for communicating relevant details of a patient's infectious status if care is transferred between clinicians or health service organisations? • Are resources to support hand hygiene, and respiratory hygiene and cough etiquette, easily accessible to patients and their carers? • How does the organisation support patients in preventing transmission of infection within the healthcare environment, at home or within the community? Are these resources accessible to patients? • How does the organisation promote hand hygiene, and respiratory hygiene and cough etiquette, to patients?
The clinical environment risk varies according to the purpose for which it is used, the design and structure, the ease with which the space can be cleaned	• What polices and guidelines are available to guide maintenance, repair and upgrade of buildings, equipment, furnishings, and fittings? • Does the organisation have a preventive maintenance program in place? • What processes are in place to evaluate and respond to infection risks for new and existing equipment, devices, and products? • Is the organisation compliant with the current Australasian Health Facility Guidelines? • Who is responsible for cleaning the environment? • Is the environmental cleaning schedule current? What processes are used to keep the environmental cleaning schedule up to date? • How are patient traffic and movement managed within the organisation to minimise infection risk? • How easy is it to clean the space? Is there clutter? • Does the care activity require a lot of equipment? • Are healthcare workers trained in environmental and equipment cleaning, personal protective equipment (PPE) use and infection prevention and control? • What environmental cleaning solutions are currently used? • Are there local risks that might increase the risk of infection, such as building renovations or outbreaks of an infectious disease?

Table 1: Examples of IPC risk considerations and risk assessment questions* (continued)

Example infection risk considerations*	Example infection prevention and control risk assessment questions*
Healthcare workers can be exposed to infectious agents from the patients or may put patients at risk of infection, if infectious or due to their IPC practice	• Does the health service organisation have a vaccine-preventable disease screening and immunisation policy and program for all healthcare workers? • Are healthcare workers assessed for their individual risk of exposure to vaccine-preventable diseases, or other infections, during the course of their work? • What strategies are in place to promote respiratory hygiene and cough etiquette among healthcare workers? • What are the hand hygiene compliance rates for different healthcare workers groups in the organisation? What strategies are in place to continually improve hand hygiene compliance among the different groups? • Is a range of PPE available and easily accessible to all healthcare workers, at all times? • Does the health service organisation provide suitable PPE for different tasks and different roles (e.g. clinical care, cleaning, engineering)? • Is there sufficient training of particular techniques that can prevent the transmission of infection? (e.g. aseptic techniques, correct use and disposal of sharps to reduce sharp injuries, hand hygiene)
The delivery of health care is healthcare workers assessing for risks, and deciding how activities can be performed safely, for both the patient and themselves	• What type of activity is being performed (e.g. invasive procedure, wound dressing, personal care)? • Where is the care being delivered (e.g. clinical setting, patient's home)? • Is the patient known to be infected or colonised with a particular microorganism? • Are there cognitive or behavioural factors that may increase the risk of the patient transmitting an infection? • Are other activities happening at the same time in the clinical area (e.g. cleaning, emergency responses)? • What resources are available for the activity (e.g. appropriate PPE, condition of the equipment)? • What actions can be taken to reduce the risk of infection transmission during the activity (e.g. aseptic technique, patient placement, transmission-based precautions)?
Clinical equipment includes new and existing equipment used for patient care and procedures; they should be routinely assessed for potential infection risks	• Does the health service organisation have a process for assessing new products and equipment? • Does the health service organisation have an equipment maintenance program for cleaning, servicing, and repair? • Are maintenance schedules for all plant and equipment up to date? • Are reusable medical devices reprocessed on site or by an external contractor? • Are staff trained to clean/reprocess medical and patient care equipment? • How are equipment, stock and reusable medical devices stored? • Do current reprocessing practices comply with current Australian Standards for reprocessing reusable devices?

Table 1: Examples of IPC risk considerations and risk assessment questions* (continued)

Example infection risk considerations*	Example infection prevention and control risk assessment questions*
Visitors and carers can be at risk of infection as well as a potential infection risk to others	• Are there facilities and products available for visitors and carers to perform hand hygiene? • Is information available for visitors and carers about current infection risks or infectious diseases? • Do clinicians provide sufficient information and education to patients and their carers on how to prevent further infection at home and in the community? • Are restrictions for visiting clinical areas needed to reduce infection risks? • If carers are involved in direct patient care, are they provided with information, training, and support to deliver care safely? • Is infection prevention and control related information available in locally used languages other than English? • Are there any visitor restrictions in place in the organisation? • Are visitors and carers aware that they should not visit patients when they themselves are unwell?

*** Note:** The above infection risk considerations and risk assessment questions are examples only. Each health service organisation will need to develop its own approach, in collaboration with its infection prevention and control team, and informed by the local context.

Table 2. Examples of IPC strategies, based on the hierarchy of controls*

Controls	Examples strategies*
Elimination: Remove the infection risk entirely	• Prompt management of spills to eliminate the risk of exposure to clinical and biological waste • Correct disposal of sharps at the point of care to prevent sharps injury • Use of telemedicine to eliminate exposure to potentially infectious patients • Effective hand hygiene, to remove infectious material from hands • Restrict entry of potentially infectious healthcare workers and visitors to the health service organisation.
Substitution: Substitute the infection hazard with a safer alternative	• Replace reusable equipment that is difficult to clean, such as cannulated or channelled devices, with single-use equipment • Introduce safety-engineered devices for cannulation and injections to prevent sharps injury • Switch from intravenous to oral administration of antimicrobial therapy, to reduce the risk of line-associated infections • Use sterile procedural equipment packs (e.g. catheter pack) to minimise disruption of aseptic technique • Administer aerosolised medicines with spacers instead of nebulisers, to prevent exposure to aerosols.
Isolation: Physically separating people from the infection hazard	• Use patient placement strategies, such as single rooms or cohorting patients • Manage surgical and clinical lists to ensure separation between susceptible individuals and individuals with an infectious disease • Increase the distance between beds • Use sharps containers at the point of use • Use physical barriers, such as privacy screens, for infections transmitted by the droplet route.
Engineering controls: Reduce the infection risk through engineering controls	• Optimise ventilation and air quality including air exchange rates, air flow and air filtration systems, temperature, and ambient humidity • Re-design of sinks and other plumbing to remove environmental reservoirs • Redesign work areas to limit the number of workers at workstations • Redesign of waste management and cleaning areas to minimise exposure to infectious material • Maintain airflow direction away from staff workstations and towards patient care areas where possible • Sharps safety devices • Install nonporous materials for work surfaces and floors.

Table 2. Examples of IPC strategies, based on the hierarchy of controls* (continued)

Controls	Examples strategies*
Administrative controls: Practices and policies that reduce or prevent exposure to infection hazards.	• Designation of an organisational lead who is responsible for implementing infection prevention and control strategies • Organisational policies consistent with the current version of the Australian Guidelines for the Prevention and Control of Infection in Healthcare • Provision of training in infection prevention and control practices to all health workforce • Provision of a risk-based workforce vaccine-preventable diseases screening and immunisation program, consistent with the current edition of the Australian Immunisation Handbook and current jurisdictional requirements. Consider the NSQHS Standards Workforce Immunisation Risk Matrix • Ensure sufficient single rooms to isolate patients requiring transmission-based precautions • Organisational policies to reduce patient movement within the facility • Requiring implementation of local policies and procedures for environmental cleaning.
Personal protective equipment (PPE): Effectiveness in preventing exposure to the infection hazard is dependent on access to appropriate PPE, correct use, and complementary substitution, administrative and engineering controls	• A sufficient and accessible supply of a range of sizes and types of PPE relevant to the infection risks in the healthcare setting • Training programs regarding correct use of PPE (such as putting on, removal and disposal), and regular competency assessment • Fit checking and fit testing protocols for particulate filter respirators (e.g. P2/N95).

*** Note:** The above infection prevention and control strategies are examples only. Each health service organisation will need to develop its own approach and strategies, in collaboration with its infection prevention and control team, and informed by the local context.

Important links and resources

Infection prevention and control:

- National Safety and Quality in Health Service (NSQHS) Standards
- Australian Guidelines for the Prevention and Control of Infection in Healthcare
- NSQHS Standards Workforce Immunisation Risk Matrix
- COVID-19 infection prevention and control risk management - guidance
- Infection Control Expert Group: Minimising the risk of infectious respiratory disease transmission in the context of COVID-19: the hierarchy of controls

Risk assessment and management

- NSQHS Standards: Action 1.10
- NSQHS Standards Risk management approach
- Safe Work Australia guidance