

Construction and Renovation at Existing Health Care Facilities: Infection prevention and control Policy Guideline

Version No.: 1.2
Approval date: 2 July 2018



Government
of South Australia

SA Health

Contents

1.	Policy Statement	3
2.	Roles and Responsibility	3
3.	Policy Requirements.....	4
4.	Implementation and Monitoring	6
5.	National Safety and Quality Health Service Standards.....	6
6.	Definitions.....	7
7.	Associated Policy Directives / Policy Guidelines & Resources	7
8.	Document Ownership & History.....	9

INFORMAL COPY WHEN PRINTED

Construction & Renovation Policy Guideline

1. Policy Statement

The objective of this policy guideline is to provide guidance on the processes required to minimise the risk of transmission of infections to patients, staff and visitors that may arise from exposure to microorganisms generated by construction and renovation activities.

This guideline is to be read and implemented in conjunction with the *SA Health Environmental management in health care facilities Policy Directive* (2018). A number of tools and resources are available in an associated toolkit.

Environmental disturbances which occur during construction or renovation projects pose both airborne and waterborne risks particularly to persons with poorly functioning immune systems. It is essential that all key stakeholders are included in all stages of the project to minimise the risk of vulnerable persons acquiring a potentially serious infection within the healthcare setting.

This guideline is applicable to all SA Health staff involved in the planning, design and management of construction and renovation activities in existing healthcare facilities. This may include (but is not limited to) Chief Executives, Directors of Nursing, architects, engineers, risk and workforce health managers, infection prevention and control coordinators, building maintenance staff, and clinical managers of areas where construction work is planned.

2. Roles and Responsibility

2.1 Chief Executive SA Health is responsible for:

- > ensuring the infection prevention and control management of building and renovation across SA Health is in accordance with this guideline.

2.2 The Infection Control Service, Communicable Disease Control Branch will:

- > maintain and periodically review the effectiveness of the SA Health Construction and Renovation at Existing Healthcare Facilities: Infection prevention and control Policy Guideline and associated resources.

2.3 Local Health Network (LHN) Chief Executive Officers will:

- > ensure health services within their area of control have systems in place that facilitate safe environments during construction and renovation. The day-to-day responsibility for establishing and monitoring the implementation of this guideline may be delegated to the relevant managers.

2.4 Executive Directors, Heads of Service and other senior managers will:

- > develop, implement and monitor local processes to support employees, and other persons providing health services on behalf of SA Health, in maintaining safe environments during construction and renovation for patients, staff and visitors
- > foster a climate which facilitates a safe environment during construction and renovation for patients, staff and visitors.

2.5 All SA Health employees involved in construction or renovation activities will:

- > take all reasonable steps to ensure they maintain a safe and hygienic environment during construction and renovation by adhering to the principles and detail of this guideline and associated toolkit.

3. Policy Requirements

Construction and renovation activity related infections due to fungi and bacteria, and subsequent deaths, are well documented. These have generally occurred in high risk units/areas that contain patients with poor immune systems such as haematology, oncology, burns and organ transplant services. The two most common groups of organisms of concern in a healthcare setting are *Aspergillus* and *Legionella* species.

Aspergillus spores can be dispersed on dust or dirt particles when floors, walls or ceilings are penetrated. Increased levels of fungal spores in the air have been associated with outbreaks of infection in hospital settings and can cause infection, particularly in patients (or staff or visitors) with poorly functioning immune systems.

Legionella bacteria can be found in natural aquatic environments as well as in soil. Reservoirs in hospitals may include cooling towers, evaporative condensers, heated potable water systems and air conditioning systems. During construction and renovation projects, water systems can be disrupted and potable water can become contaminated with *Legionella* when the water supply is restored. Contamination may be related to descaling in the water pipes when re-pressurised or the introduction of soil into the water system.

Certain measures during renovation and construction are required to ensure that risks of exposure to microorganisms are minimised, and can include:

- > Conducting random construction site inspections to ensure effective precautions are in place to prevent dust infiltration into patient-care areas. Precautions may include sealing air-conditioning vents, windows and doors, using portable HEPA filters, or generating negative air pressure within the construction area.
- > Environmental air sampling prior to commissioning of operating theatres and clean rooms (when applicable) which includes microbiological sampling of the air, particle testing, air flow testing and assessing pressure differentials. Guidance on microbiological sampling indications and methods can be found in the *SA Health Infection Prevention and Control during Construction and Renovation Toolkit*. Guidance on assessing pressure differentials can be found in section 6 of AS/NZS 1668.2-2012. *The use of ventilation and air conditioning in buildings. Part 2: Mechanical ventilation in buildings*.

3.1 Pre-design planning and consultation stage

Before beginning construction or renovation projects key issues need to be addressed. The following elements should be considered:

- > establishing a multidisciplinary team with representation from infection control, worker health, safety and quality/risk management, contractors, and staff responsible for facilities management
- > ensuring infection prevention and control measures are incorporated in the design and function of the new structure/area
- > assessing airborne disease transmission risk and prevention strategies

- > implementing measures to contain dust
- > monitoring of these requirements during the project.

3.2 Risk assessment

Completion of a risk assessment is the most crucial step in identifying potential hazards and the containment measures necessary to maintain a safe environment. A risk assessment includes consideration of:

- > persons at risk – the patients most at risk in a hospital are patients with severely compromised immune systems such as those in haematology or transplant units
- > external factors – such as location of air intakes, ventilation system design features, infiltration points, penetration of existing walls and weather conditions
- > internal factors – utility outages, specific training requirements, high risk activities, hazard control measures and location of the construction or renovation.
- > access points – construction site entry and exit points away from ward areas.

A comprehensive risk assessment during the planning phase will determine the level of precautions required and is dependent on the:

- > type of construction or activity
- > proximity to high risk patient groups

Note: for type B activities (i.e. those which generate minimal dust) that are being undertaken in areas that house high risk patients, the level of dust containment will depend on the potential impact in patient care areas, e.g. a cabling installation in a corridor adjacent to patient rooms may not require full sealing of the area and air-conditioning shut down if patients can be moved, doors closed etc., which would mitigate the risk to these patients.

A construction and renovation risk assessment tool can be found in the associated *SA Health Construction and Renovation Toolkit*.

3.3 During and upon completion of building works

Records of assessment, checklists and all relevant documentation should be maintained during the project.

An infection prevention and control staff member, or delegate, should inspect dust barriers and other protective measures on a regular basis, with the frequency depending on the risk assessment of the area involved. For example, if the construction or renovation includes high risk areas, as identified in the “*Construction and Renovation Toolkit Step 2 – Identify patient risk groups*”, then daily inspection and monitoring is recommended using the environmental monitoring compliance checklist.

After completion of works but before occupation, the area must be inspected to ensure it is fit for purpose. This should include demonstrating the area has been thoroughly cleaned and disinfected (such as walls, floors, ceilings and air vents). A completion checklist can be found in the *Construction and Renovation Toolkit*.

Air sampling may be required after construction or renovation activities before using an operating room, high risk areas where severely compromised patients will be accommodated, and pharmacy clean rooms, if these areas have been involved in or affected by the construction process. If air sampling and particle counts will be conducted, allow enough time to obtain satisfactory results prior to occupation. Guidance on microbiological sampling indications and methods can be found in the *Construction and Renovation Toolkit*.

HEPA filters and laminar flow systems should be re-certified where installed.

If the water supply has been disrupted during construction/renovation then the taps should be flushed and water sampling performed as recommended in the *Guidelines for the Control of Legionella in manufactured water systems in South Australia* (2013). *Legionella* counts should be within acceptable levels (<10 cfu/ml) prior to occupation.

Swabbing of environmental surfaces is not required.









4. Implementation and Monitoring

Compliance with all elements of this guideline must be demonstrated through audits of process i.e. ensuring all checklists and processes found in the attached documents have been completed, and an action plan is developed and implemented to address deficiencies.

Any breaches of compliance found when completing the Environmental Monitoring Checklist and the Completion of Project Checklist are required to be reported to the nominated person with overall responsibility for the construction project.









The effectiveness of this guideline will be assessed by viewing the results of accreditation assessments against the NSQHS standards 1 and 3.

5. National Safety and Quality Health Service Standards

 National Standard 1 Clinical Governance	 National Standard 2 Partnering with Consumers	 National Standard 3 Preventing & Controlling Healthcare-Associated Infection	 National Standard 4 Medication Safety	 National Standard 5 Comprehensive Care	 National Standard 6 Communicating for Safety	 National Standard 7 Blood Management	 National Standard 8 Recognising & Responding to Acute Deterioration
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please note the National Standard/s above apply until 31 December 2018 and are to be used until then.

The National Standards below will be implemented from 1 January 2019.

 National Standard 1 Clinical Governance	 National Standard 2 Partnering with Consumers	 National Standard 3 Preventing & Controlling Healthcare-Associated Infection	 National Standard 4 Medication Safety	 National Standard 5 Comprehensive Care	 National Standard 6 Communicating for Safety	 National Standard 7 Blood Management	 National Standard 8 Recognising & Responding to Acute Deterioration
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

National Standard 1: Governance for Safety and Quality in Health Service Organisations.

- > Criterion 1.5: Establishing an organisation-wide risk management system that incorporates identification, assessment, rating, controls and monitoring for patient safety and quality

National Standard 3: Preventing and Controlling Healthcare Associated Infections.

- > Criterion 3.1: Developing and implementing governance systems for effective infection prevention and control to minimise the risks to patients of healthcare associated infections
- > Criterion 3.15: Using risk management principles to implement systems that maintain a clean and hygiene environment for patients and healthcare workers.

6. Definitions

In the context of this document:

- > **air sampling means:** the collection and analysis of samples of air to measure the amounts of various pollutants or other substances in the air.
- > **Aspergillus means:** the genus *Aspergillus*, a filamentous fungus widely distributed in nature that releases spores which can remain suspended in air for prolonged periods.
- > **construction means:** the process of preparing and forming buildings
- > **design means:** the creation of a plan for the construction of a building
- > **HEPA means:** high-efficiency particulate air. This is a type of air filter that removes 99.97% of particles larger than 0.3 µm in diameter.
- > **immunocompromised person means:** a person who has impaired ability to fight off infection.
- > **Legionella means:** a Gram-negative, aerobic, rod-shaped bacterium of the genus *Legionella*, found in natural aquatic environments as well as soil and dust.

7. Associated Policy Directives / Policy Guidelines & Resources

7.1 Associated policy directives and policy guidelines

- > [SA Health Cleaning Standard for Healthcare Facilities Policy Directive, 2018](#)
- > [SA Health Guidelines for the control of Legionella in manufactured water systems in South Australia, 2013](#)
- > [SA Health Environment Management of Health Care Facilities Policy Directive, 2018](#)
- > [South Australian Public Health \(Legionella\) Regulations, 2013](#)

7.2 Resources

A comprehensive toolkit (available on the SA Health website as separate documents) is available for use with this guideline and includes:

- > Construction risk assessment tool
- > Environmental monitoring compliance checklist
- > Building Project completion checklist

> Microbiological air sampling: indications and methods

Resources related to the risk management in care facilities are available on the SA Health [Legionella related risk management in care facilities](#) web page.

7.3 References

1. Australasian Health Infrastructure Alliance (AHIA). 2012. *Australasian Health Facility Guidelines, Part D- Infection Prevention and Control*. Available from: <http://healthfacilityguidelines.com.au/guidelines.aspx>
2. American Society for Healthcare Engineering (ASHE). 2014. *Guidelines for Design and Construction of Hospitals and Outpatient Facilities*. The American Institute of Architects, Academy of Architecture for Health. The Facilities Guidelines Institute.
3. Vonberg R.P, Gastmeier P, Nosocomial aspergillosis in outbreak settings. *J Hosp Infect*, 2006. 63(3): 246-54.
4. Bartley J M, Russell N, Haas J. Current views of health care design and construction: Practical implications for safer, cleaner environments. *Am J Infect Control* 2010; 38:S1-12.
5. Bartley J M. APIC state-of-the-art-report: the role of infection control during construction in healthcare facilities. *Am J Infect Control* 2000; 28: 56–235.
6. Health Canada. Construction-related Nosocomial Infections in Patients in Health Care Facilities: Decreasing the Risk of *Aspergillus*, *Legionella* and Other Infections. *Can Commun Dis Rep* 2001. July; 27 Suppl. 2:i-x, 1-42, i-x, 1-46.
7. Mermel LA, Josephson SL, Giorgio CH, Dempsey J. Association of Legionnaires' Disease with Construction Contamination of Potable Water? *Infect Control Hosp Epidemiol* 1995; 16: 76-81.
8. Moon K, Hellsten J, Woodburn P. 2005. Infection Control Principles for the Management of Construction, Renovation, Repairs and Maintenance within Health Care Facilities – a manual for reducing the risk of health care associated infection by dust and water borne microorganisms. Loddon Mallee Region Infection Control Resource Centre, Victoria.
9. National Health and Medical Research Council. 2010 Australian Guidelines for the Prevention and Control of Infection in Healthcare, Commonwealth of Australia.
10. SA Health Construction and renovation toolkit, available from: <http://www.sahealth.sa.gov.au/infectionprevention>
11. Sehulster LM, Chinn RYW, Arduino MJ, et al. 2004. Guidelines for environmental infection control in health-care facilities: recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). Chicago IL; American Society for Healthcare Engineering/American Hospital Association.
12. Standards Australia. SAA/SNZ HB32:1995. *Control of microbial growth in air-handling and water systems in buildings*.
13. Standards Australia. HB 260–2003. *Hospital acquired infections – engineering down the risk*.
14. Standards Australia. AS/NZS 3666.1-2011. *Air-handling and water systems of buildings – Microbial control. Part 1: design, installation and commissioning*.
15. Standards Australia. AS/NZS 3666.2-2011. *Air-handling and water systems of buildings – Microbial control. Part 2: Operation and maintenance*.

16. Standards Australia. AS 1668.2-2012. *The use of ventilation and air conditioning in buildings. Part 2: Mechanical ventilation in buildings.*

17. Document Ownership & History

Document developed by: (insert branch/unit and division name)

File / Objective No.: e.g. 2014-04505 | A905724

Next review due: 01/07/2023

Policy history: Is this a new policy (V1) **N**

Does this policy amend or update an existing policy version **Y**

If so, which version? V1.1

Does this policy replace another policy with a different title? **Y**

If so, which policy (title)?

Infection Prevention and Control during Construction and

Renovation at Existing Healthcare Facilities Policy Guideline, V1.1

ISBN

978-1-76083-023-6

Approval Date	Version	Who approved New/Revised Version	Reason for Change
2/07/18	V1.2	A/Director, Communicable Disease Control Branch	Formally reviewed in line with 1-5 year scheduled timeline for review. New template & references updated
9/04/15	V1.1	Manager, Infection Control Service	References updated
12/02/15	V1.0	Portfolio Executive	Original approved version.