

# Updated: Contamination of heater cooler units with *Mycobacteria chimaera*



## **N** SAFETY NOTICE 001/25

Issue date:	21 January 2025
Replaces:	SN005/22
Content reviewed by:	NSW M chimaera expert panel, Infection Prevention and Control, Communicable Diseases Branch
Distributed to:	Chief Executives; Directors of Clinical Governance, HAI Operational Expert Advisory Committee
<b>KEY MESSAGE:</b>	Ensure heater cooler devices used in cardiothoracic surgery are maintained to prevent <i>Mycobacterium chimaera</i> contamination following two new contamination incidents.
<b>ACTION REQUIRED BY:</b>	Clinicians, Directors of Clinical Governance, Chief Executives
<b>REQUIRED ACTION:</b>	<p>Ensure management of heater cooler units (HCU) as follows</p> <ul style="list-style-type: none"> <li>• Cleaning and disinfection as per manufacturer's instructions for use</li> <li>• Water testing for <i>M. chimaera</i> as per manufacturer's instructions</li> <li>• Test a new, or returned from repair or maintenance HCU device for <i>M. chimaera</i> and quarantine the device until the results are returned negative</li> <li>• HCUs in use are fitted with an exhaust system</li> <li>• HCUs in use have had sealed water tanks</li> </ul>
<b>DEADLINE:</b>	
We recommend you also inform:	Directors, Managers and Staff of: Cardiothoracic Surgery, Operating Suites, Perfusion and Anaesthetics, Intensive Care Units, Infectious Disease and Microbiology, Infection Prevention and Control
Website:	<a href="https://www.health.nsw.gov.au/sabs/Pages/default.aspx">https://www.health.nsw.gov.au/sabs/Pages/default.aspx</a> <a href="http://internal.health.nsw.gov.au/quality/sabs/index.html">http://internal.health.nsw.gov.au/quality/sabs/index.html</a>
Review date:	February 2027

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## Situation

Two heater cooler units in separate Local Health Districts have been found on routine testing to be culture positive for *Mycobacterium chimaera*. One of these devices is brand new and was tested prior to use. Whole genome sequencing shows these isolates to be identical, and they appear to be genetically related to the 2015 outbreak strain. Although neither machine had been used in patient care while it was contaminated, this was a potential risk for one device as it was marked for use. This machine had been idle for some time and testing occurred prior to intended use according to current procedure. This highlights the importance of ongoing cleaning requirements including machines that have been sitting idle between use. Investigations are ongoing to establish the source(s) of contamination.

## Background

Serious and fatal infections with an unusual mycobacterial species, *Mycobacterium chimaera*, have been reported in patients who have had open cardiac surgery linked to contaminated heater-cooler units (HCUs) used in cardiac bypass surgery. There have been eight cases in NSW (most recent case in early 2022) and more than 120 worldwide of confirmed human infection with *M. chimaera* linked to heater cooler units. The route of transmission is thought to be via aerosolisation of condensate through the device's exhaust vent into the operating theatre (OT) environment. The overall risk of infection to individual patients is low, however infection presentation may be very delayed, with the most recent infection in NSW reported 7 years after surgery.

Mitigation strategies include regular testing of HCU water for *M. chimaera*, appropriate placement of the unit in the operating theatre, as well as ensuring HCUs have sealed water tanks and protected exhaust. Regular cleaning and disinfection remain a key mitigation strategy.

## Assessment

Testing confirms that contamination of HCUs with *M. chimaera* remains a risk. For these two events, there is no apparent risk to patients. However, this is a reminder that ongoing best practice and vigilance are required.

## Recommendations

Local Health Districts and networks should

- Review cleaning and disinfection procedures for HCUs and ensure manufacturers' guidelines are followed for cleaning, disinfection and maintenance schedules and processes. This also applies where external cleaning contractors in use.
- Conduct water testing as per manufacturer's instructions
- Ensure HCUs have sealed water tanks and exhaust protection (if relevant)
- Be aware that device contamination may also occur from other sources such as environmental contamination or device contact with other contaminated accessories.

- Review placement and positioning of HCUs. (See Australian Commission on Quality and Safety in Health Care. National Infection Control Guidance Non-tuberculous Mycobacterium infections associated with heater-cooler devices. [Updated 2022](#))
- Follow manufacturer’s instruction for storage of heater-cooler units and accessories when not in use, which may include removing all water from the device and tubing
- Ensure there is a tracking system in place to match a HCU with a patient procedure (in case of look back)
- If a positive result for *M. chimaera* is reported, immediately remove the device from use and notify the NSW Health Clinical Excellence Commission ([cec-hai-ipac@health.nsw.gov.au](mailto:cec-hai-ipac@health.nsw.gov.au)) and the Communicable Diseases Branch ([moh-cdbspecialistprograms@health.nsw.gov.au](mailto:moh-cdbspecialistprograms@health.nsw.gov.au)). Implement local process to investigate possible contamination source and review all processes in the use, cleaning and disinfection, placement and management of HCUs

## Further information

Links to websites

[Therapeutics Goods Administration Safety Alert updated 2023](#)

[Australian Commission on Quality and Safety in Health Care. National Infection Control Guidance Non-tuberculous Mycobacterium infections associated with heater-cooler devices. Updated 2022](#)

[NSW Health Mycobacterium chimaera and heater-cooler devices updated 2024](#)

[NSW Health -reminder for clinicians updated 2022](#)

Referenced literature

1. Sommerstein R, Hasse B, Marschall J, et al. Global Health Estimate of Invasive Mycobacterium chimaera Infections Associated with Heater-Cooler Devices in Cardiac Surgery. *Emerg Infect Dis*. 2018;24(3):576-578. doi:10.3201/eid2403.171554
2. Overton K, Mennon V, Mothobi N, et al. Cluster of invasive Mycobacteria chimaera infections following cardiac surgery demonstrating novel clinical features and risks of aortic valve replacement. *Intern Med J*. 2018;48(12):1514-1520. doi:10.1111/imj.14093
3. Hasse B, Hannan MM, Keller PM, et al. International Society of Cardiovascular Infectious Diseases Guidelines for the Diagnosis, Treatment and Prevention of Disseminated Mycobacterium chimaera Infection Following Cardiac Surgery with Cardiopulmonary Bypass. *J Hosp Infect*. 2020;104(2):214-235. doi:10.1016/j.jhin.2019.10.009