Public Health England

Briefing Note
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Event	**Mycobacterial infections associated with heater cooler units used for cardiopulmonary bypass during surgery**
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PHE NIRP	**Level 3**
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Background

This briefing note provides an update on the investigation of heater cooler units used for cardiopulmonary bypass and links to advice for cardiothoracic surgery providers and laboratories.

Switzerland, the Netherlands and Germany have reported cases of invasive infection in patients after cardiac surgery, caused by an unusual organism, *Mycobacterium chimaera*. They attribute these infections to transmission of organisms from contaminated heater cooler units used in theatre during cardiothoracic surgery, via production of an aerosol of contaminated water from the device. Case numbers in all countries are very low but infections were severe, including endocarditis and disseminated infection, with some deaths.

Findings from the UK investigation suggest a similar potential risk. Through retrospective case finding, 13 cases of endocarditis, deep surgical site infection or disseminated infection with *M. chimaera* and other similar mycobacteria in cardiothoracic surgery patients have been identified in the UK. These include some deaths although it is not yet clear how many of these are attributable to the infection. All cases had valve replacement or repair. The link with the heater cooler unit has not been proven in the UK, however we have demonstrated under controlled laboratory conditions that a heater cooler can generate a microbial aerosol when running. Air and water sampling from heater cooler units at five NHS Trusts has identified contamination of many of the machines, including environmental mycobacteria.

The mycobacteria found in the heater coolers may reflect colonisation from local water sources or could theoretically represent a point source contamination. It is possible that other organisms could be transmitted in the same way.

On 09 June 2015, the manufacturer of a heater cooler unit potentially associated with known cases, Sorin, issued a Field Safety Notice (FSN) recommending microbiological testing, enhanced decontamination, and the removal of some machines which are contaminated from service. **The Field Safety Notice has the potential to significantly disrupt UK cardiothoracic surgical services.** Sorin supplies heater coolers to the majority of cardio-thoracic units in the UK including both NHS and Independent Sector providers. Based on our initial investigations, a high proportion of UK heater cooler units may be contaminated. It should be noted that the risk may not be limited to any particular brand of device and other devices are currently under investigation.

PHE has published advice to cardiothoracic surgery providers to support them in managing this risk appropriately, in association with the Society for Cardiothoracic Surgery and the Association of Cardiothoracic Anaesthetists.

Advice to providers of cardiothoracic surgery, a quantitative risk assessment and sampling SOPs can be found at:
https://www.gov.uk/government/collections/mycobacterial-infections-associated-with-heater-cooler-units

PHE may be able to provide support to NHS Trusts which require assistance with air sampling: Contact allan.bennett@phe.gov.uk

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Distribution

- Public Health England Centres
- Regional microbiologists, for onward cascade to clinical microbiology departments
- PHE Surgical Site Infection Surveillance Service participants
- Association of Independent Healthcare Organisations

Please note that separate communications to members have been issued by the Society for Cardiothoracic Surgeons, Association of Cardiothoracic Anaesthetists and Society of Perfusionists of Great Britain and Ireland.

Implications for PHE sites and services
Local, regional and national PHE teams may be asked for advice on whether to continue performing surgery if devices are found to be contaminated, or related queries. Please refer to the agreed advice at https://www.gov.uk/government/publications/mycobacterial-infections-advice-for-cardiothoracic-surgery-providers

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Health Protection Teams and SMS laboratories may be involved in local investigation of potential cases. Please notify the HCAI & AMR team (Theresa Lamagni) of any suspected or confirmed cases of non-tuberculous mycobacterial infection after cardiothoracic surgery on bypass, or other infections that you believe may be related to heater cooler units.

TB reference laboratories: *M. intracellulare* or *M. chimaera* isolates from cases suspected of being related to the use of heater cooler units should be sent to NMRL London.

Sources of information
Contacts for all relevant PHE staff, other agencies and professional societies are provided in this document:
https://www.gov.uk/government/publications/mycobacterial-infections-advice-for-cardiothoracic-surgery-providers