

2021 Heater Cooler Degradation

Permission to print:	Yes
Category	Heater Cooler unit
Incident type	Good Catch No Harm Incident
Type of incident:	Equipment
Duration of incident:	minutes
Description:	<p>Prolonged CPB (CABG BSA 2.18), Inability to rewarm large patient when asked to by surgeon [using a] 3T HCU, Inspire8 oxygenator, Maquet HL20 HLM. During bypass when asked to rewarm the patient by the surgeon to a normothermic state the perfusionist set the 3T to 38C. The patient n/p temperature was 33.4C but the recorded arterial blood temperature measured at the oxygenator only achieved 34.7C. Inspection of HCU hoses confirmed (some) flow was present from 3T HCU to heat exchanger. As the blood temperature was not the expected temp for the setting on the HCU, the HCU hosing was disconnected and coupled on itself to check the HCU flow and heating performance and correct HCU performance was confirmed. The HCU lines were reconnected to oxygenator and rewarming recommenced with no change to the blood temperature. Connection of the cardioplegia heating hoses to the oxygenator to see if this warmed the blood was without effect despite setting the temperature at HCU to up to 40 (patient side) and 41 (cardioplegia side). Discussion involving the surgeon, cardiac anaesthetist and perfusion team resulted in the decision to change out oxygenator to replace the heat exchanger. The patient was ventilated (cross clamp was off) and change out of the oxygenator completed in 3 minutes. Rewarming commenced with expected temperatures and normothermic temperature regained in a reasonable time. On inspection of the oxygenator the heat exchanger was found to be clogged with a sludge-like black/ grey substance from heater cooler inlet. The company was notified and the oxygenator was flushed of blood, bio-bagged and couriered to company. A company technician was sent to inspect water tanks in HCU. On inspection of HCU by technician there was particulate matter flaking off the elements in the tanks. The company technician scrubbed all tanks with brush and flushed tanks - more particles came away. Of note all heater coolers are cleaned as per manufacture IFU (Mincare/ H2O2). The presence of particulates when cleaning tanks as per IFU is a known fact that has been reported on several occasions to company and assured that it is not a problem but just the coating to the coil in the tank to prolong the life of the units.</p>

GOOD CATCH - what went well Timely changing out and De-airing of oxygenator. Communication of team

What could we do better Checked for particulates while integrity testing the HCU (never previously done)

Preventive actions Check for particulates in the water hoses. Daily water changes. Confirmation via email that the IFU cleaning says the same at present email from company.

Hospital incident filed: Yes

Ext Authority Advised Yes

Discussed with team: Yes

Manufacturer advised: Yes

Commentary Problems of degradation of the 3T HCU after disinfection has been previously documented (1) but the PIRS2 is not aware of an associated failure of a heat-exchanger. This occurred with the users strictly following the IFU for decontamination. Given the ubiquitous use of the 3T HCU in Australasia and elsewhere and the mandatory compliance with decontamination readers should be observant for signs of 3T HCU degradation. PIRS2 Ed. (1) Sgarvey MI, Bradley CW, Walker J. A Year in the Life of a

Contaminated Heater-Cooler Unit With *Mycobacterium chimaera*? Infect Control Hosp Epidemiol. 2017 Jun;38(6):705-711. doi: 10.1017/ice.2017.64. Epub 2017 May 5. PMID: 28473009.

Photos of the 3T HCU particulates from the device used in the oxygenator heat-exchanger failure incident

