Permission to print:	Yes
Catagory	Air embolism
Near Miss or Accident	Accident
Type of incident:	Management
Knowledge Error	No
Rule Error	No
Skill Error	No
Team Issue	Yes
Violation	No

Description: The surgeon routinely passed back the cardioplegia delivery line from the sterile field. This was connected to the primed delivery set on the HLM. Due to the short length of tubing on the HLM side it is standard practice for the group to prime a further 30cm or so into this line and reclamp prior to aortic cannulation. The other end of the cardioplegia line has the 1/4" perfusion adaptor and the "Y" line with integral cricket clamps for antegrade and retrograde delivery. The stem of the "Y" is attached to the perfusion adaptor of the HLM cardioplegia line and the left hand branch is attached to the aortic root cannula in situ. The aortic root cannula cricket clamp is released and the left hand arm is primed using aortic root pressure to flush out through the right hand arm of the "Y" delivery line. The left hand branch is then normally clamped at this point and the HLM cardioplegia line flushed to the table out the right hand branch before it is connected to the retrograde cannula. Whilst both left and right arms of the "Y" were in the clamped position, the HLM cardioplegia line assembly was attached to the aortic root cannula. Seeing both branches of the "Y" clamped, the surgeon then released the left hand aortic root branch cricket clamp before unclamping the right hand branch cricket clamp to prime the "Y", releasing the pressure and introducing a small amount of air into the ascending aorta. N.B. The surgeon had expressly asked that the cardioplegia line not be primed up to the table until requested and I assumed that this meant whilst on CPB.

Contributing factors: A classic James Reason "Swiss Cheese" accident model scenario: The surgeon was distracted whilst explaining the technique to an observer. The scrub nurse had not worked in the cardiothoracic theatre for some time. The line was pressurised below the line pressure alarm limit of 250mmHg set for cardioplegia delivery. Confusion regarding the implicit instruction for when to prime the cardioplegia line.

Corrective action: It was deemed that a small unknown amount of air had entered the aortic root prior to aortic cross-clamping. There was no change in the BIS nor were any ST changes observed on the ECG. Steroids were administered, hypertension was induced and 100% oxygen delivered to the oxygenator. The patient was cooled to 32oC as per the surgeon's protocol for CABG.

Preventative action plan: The incident was discussed immediately after the operation with all parties. The patient was woken 5 hours postoperatively and remained under observation in intensive care (due to a Ward bed shortage) for two days with no neurocognitive sequelae. The surgeon has subsequently modified their technique whereby they prime the cardioplegia line and "Y" delivery line completely before attaching to the aortic root cannula.

Manufacturer advised:	No
Discussed with team:	Yes
Ext Authority Advised	No
Hospital incident filed:	Yes
Patient outcome variance f	Nil