2025 Air in Circuit (Arterial line)

Permission to print:	Yes
Category	Air in circuit
Severity	Good Catch Near Miss
Duration of incident:	minutes
Description:	An Essenz HLM and Terumo FX15 oxygenator with integrated arterial filter was being used for straightforward coronary artery bypass grafting. Priming uneventful with plasmalyte and 20% albumen; "small tubing circuit" [3/8” venous line] was used as patient BSA < 1.8. Priming gas confirmed pO2 > 550mmHg. ACT 776 sec after heparin. The arterial line was placed by the surgeon, line pressures checked and equal to MAP. RAP performed. Venous line [cannula] placed by the surgeon. "On bypass" with VAP performed simultaneous with bypass commencement. Sevoflurane started. Some low flows due to poor venous return - hartmanns added, venous occluder fully opened. Cardioplegia line primed. Flows down for cross-clamp placement. Antegrade aortic root hyperkalaemia blood cardioplegia run; good pressure response. ~ 3 minutes into plegia, "Arterial air alarm" and pump stopped. Perfusionist inspected the arterial line - air visible just distal to bubble device . (The bubble alarm was on the arterial line after the bifurcation of our “recirculation” line which shunts back to the venous reservoir – the low level sensor was at 250 mL and placed to allow gradual stop from 275 ml). The arterial line was clamped on the patient side of air. Recirculation line opened, arterial line briefly opened to allow back flow. Art line reclamped and recirculation run from oxygenator to confirm nil further air. Purge line from oxygenator opened. Arterial line reopened and flows re-established. ~ 90 seconds complete no flow. ~1 minute later further arterial air alarm -> this time nil air visible in line but appeared [bubble sensor] device not fully closed. Device clamped, alert override. Flows re-established. Remainder of case uneventful. I am very dedicated to debubbling for long time with purge open (to the point that anaesthetists have commented that I spend more time on my knees with a tendon hammer than some other perfusionists. I also ensure to clear the air bubble that sometimes sits at the origin of the cardioplegia line. The suspicion is that the air has come from oxygenator membrane ?malfunction?
GOOD CATCH - what went	Arterial air detector link to main pump -> stopped pump with time to catch air in line. Recognition by perfusionist to protect patient.
What could we do better	Speed of back bleeding air and re-establishing bypass. Trainee perfusionist who needed some guidance (eg: opening purge line).
Preventive actions	Oxygenator returned to Terumo for inspection
Type of incident:	unknown
Manufacturer advise	Yes
Timing of incident:	CPBnormothermic
Discussed with team:	Yes
Hospital incident filed	Yes
Ext Authority Advised	Yes
Patient outcome variance	Nil

Commentary	This is the second report of air in the arterial line in recent weeks, both of which were managed effectively by similar means. The importance of agreed team management strategies for arterial line air entrainment cannot be overemphasised. PIRS Eds