References	Evidence Level (I-VII)	Key findings, outcomes, or recommendations
Efficacy of 0.2micron filters in preventing air or particle emboli		
Lee, S., & Bulsara, K. R. (2020). Assessing the efficacy of commercially available filters in removing air micro-emboli in intravenous infusion systems. *The Journal of Extra-corporeal Technology*, *52*(2), 118.	III	• The Braun SUPOR membrane 0.2micron filter reduced air micro-emboli by volume and count by 100% ($p < .0001$) compared with –0.6 ± 3.5% by volume and –0.8 ±1.5% by count for the no filter control • The GVS 0.2micron filter reduced air micro-emboli volume by 99.86% compared with 0.11% in the control ($p < .0001$). The GVS 0.2micron filter reduced air micro-emboli count by 88.52 % compared with – 0.17% in control ($p < .0001$) • There was no statistically significant difference in the removal efficacy between the two filter models ($p > .05$)
Perez, M., Décaudin, B., Abou Chahla, W., Nelken, B., Storme, L., Masse, M., ... & Odou, P. (2018). Effectiveness of in-line filters to completely remove particulate contamination during a pediatric multidrug infusion protocol. *Scientific Reports*, *8*(1), 1-8.	IV	• In-line filters significantly reduced overall particulate contamination during 24-hour infusion period compared to no filter ($p<0.0001$)
Improvements in health outcomes associated with in-line 0.2micron filter use		
Jack, T., Boehne, M., Brent, B. E., Hoy, L., Köditz, H., Wessel, A., & Sasse, M. (2012). In-line filtration reduces severe complications and length of stay on pediatric intensive care unit: a prospective, randomized,	II	• Reduction in the overall complication rate ($n = 166$ vs. $n = 124$; $p = 0.003$) for critical ill PICU patients in the filter group compared with those in no filter group.

controlled trial. *Intensive Care Medicine*, *38*(6), 1008-1016.		• Lower incidence of SIRS (*n* = 123 vs. *n* = 90; *p* = 0.01) in the filter group • Reduced length of stay in PICU (3.89 [95 % confidence interval 2.97-4.82] vs. 2.98 [2.33-3.64] days; *p* = 0.025) in the filter group • Reduced duration of mechanical ventilation (14.0 [5.6-22.4] vs. 11.0 [7.1-14.9] hours; *p* = 0.028) in the filter group
Sasse, M., Dziuba, F., Jack, T., Köditz, H., Kaussen, T., Bertram, H., ... & Boehne, M. (2015). In-line filtration decreases systemic inflammatory response syndrome, renal and hematologic dysfunction in pediatric cardiac intensive care patients. *Pediatric Cardiology*, *36*(6), 1270-1278.	II	Risk of SIRS (-11.3 %; 95 % CI -21.8 to -0.5 %), renal (-10.0 %; 95 % CI -17.0 to -3.0 %) and hematologic (-8.1 %; 95 % CI -14.2 to -0.2 %) dysfunction were significantly decreased in paediatric cardiac intensive care patients within the filter group compared to those in the no filter control group.
Schmitt, E., Meybohm, P., Herrmann, E., Ammersbach, K., Endres, R., Lindau, S., ... & Neb, H. (2019). In-line filtration of intravenous infusion may reduce organ dysfunction of adult critical patients. *Critical Care*, *23*(1), 1-11.	IV	Reductions in respiratory dysfunction (*p* = 0.04), pneumonia (*p* = 0.02), sepsis (*p* = 0.03), interleukin-6 (*p* = 0.01), and length of ICU (*p* < 0.01) and hospital stay (*P* = 0.01) were found in critically ill adult patients in the group using fine 0.2 and 1.2 µm filters compared with those in the control group using 5.0 µm filters.
Emboli case studies		
Levy, I., Mosseri, R., & Garty, B. (1996). Peripheral intravenous infusion—another cause of air embolism. *Acta Pædiatrica*, *85*(3), 385-386.	VI	A 3mL/kg air embolus from an intravenous line resulted in acute cardiopulmonary distress in a 4-week-old.
Toung, T. J., Rossberg, M. I., & Hutchins, G. M. (2001). Volume of air in a lethal venous air embolism. *The Journal of the American Society of Anesthesiologists*, *94*(2), 360-361.	VI	A lethal air volume estimate of 200 to 300 mL in adults was deduced from three case studies.

Watkins, S. C., McCarver, L., VanBebber, A., & Bichell, D. P. (2012). Venous air embolism leading to cardiac arrest in an infant with cyanotic congenital heart disease. *Case Reports in Anesthesiology*, *2012*.	VI	Air embolism involving a 3-month-old patient with single ventricle physiology after cavopulmonary connection led to complete obstruction to pulmonary blood flow and cardiopulmonary arrest.
Romero, J. R., Frey, J. L., Schwamm, L. H., Demaerschalk, B. M., Chaliki, H. P., Parikh, G., ... & Babikian, V. L. (2009). Cerebral ischemic events associated with 'bubble study'for identification of right to left shunts. *Stroke*, *40*(7), 2343-2348.	VII	Reports five case studies of ischaemic cerebrovascular complications associated with 'bubble study' used to diagnose cardiac or pulmonary shunts.