

A new technique for measuring cardiac output and shunt fraction during venovenous extracorporeal membrane oxygenation

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A new indicator dilution technique is described for measuring cardiac output and shunt fraction in patients undergoing venovenous extracorporeal membrane oxygenation (ECMO). Shunt fraction is the proportion of the ECMO pump flow which recirculates through the ECMO circuit (passing directly from the inflow cannula to the outflow cannula) instead of flowing through the pulmonary and systemic circulations. The indicator is an isotonic (150 mmol/l) solution of lithium chloride which is injected into the ECMO flow returning to the patient. Two lithium sensors are used simultaneously to record the resulting lithium dilution curves in arterial blood and in the blood in the ECMO circuit. Cardiac output and shunt fraction are derived from these curves. The techniques, which is simple and safe, provides measurements that allow optimal adjustment of ECMO flow and cardiovascular support.