Risk of air embolism when administering intravenous fluids

Information for Victorian health clinicians

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Overview

There is currently a national shortage of intravenous (IV) fluid bags across multiple suppliers, with disruptions to supply expected to continue into early-to-mid 2025. Products impacted include various brands and volumes of sodium chloride 0.9% IV solution, compound sodium lactate (Hartmann's solution) IV solution and glucose 5% IV solution.

Situation

There is a risk of air embolism when an IV fluid product is administered without the use of an in-line air detection device. Some IV fluid products may be associated with a higher risk of air embolism due to the larger volume of residual air within the bag. The risk is further heightened when pressurising IV fluids in flexible bags (for example, using an inflatable pressure cuff) is used to increase flow rates, if the residual air in the bag has not been fully evacuated prior to administration.

Background

Due to the ongoing global disruptions in the supply of various IV fluid products, the Therapeutic Goods Administration has approved several international alternative products for use in Australia under Section 19A of the Therapeutic Goods Act 1989.

While the risk of air embolism is not unique to the section 19A-approved alternatives, some of these products may contain considerably more air than their Australian-registered counterparts Additionally, there may be limited data regarding their suitability for use with pressurised infusion systems.

Assessment

Clinicians must be aware of the potential risk of air embolism when administering IV fluids without in-line air detection, especially during pressurised infusion. To help mitigate this risk, the strategies outlined below should be followed.

Recommendations

All fluid bags, including those that are locally manufactured, contain air in the bag. Higher volumes of air may increase risk of air embolism. Continue to manage this risk using best clinical practice and careful monitoring of air in the line. The following steps will minimise risk:

- Administer IV fluids via a volumetric infusion pump or other device with air in-line detection where possible.
- Assess the appropriateness for use of rapid/pressurised infusion devices on a case-by-case basis considering specific patient factors, IV fluid product compatibility and treatment requirements.

- Where a pressurised infusion is required, it is recommended to:
  - undertake a risk assessment of the fluid bag (for example, the amount of air in the bag)
  - remove the air from the bag via the medication port using a 19-gauge needle and 20mL syringe
  - insert and secure the bag while horizontal and inflate the cuff prior to hanging.
  - hang the cuff and bag vertically and prime the line
  - check the line for presence of air
  - monitor the line closely for the presence of air for the duration of the infusion.