Regional Medicines Optimisation Committee (RMOC)

Maintaining Patency of Central Venous Catheters in Adults

Position Statement on heparinised saline for central venous catheter lock in adults

February 2019
Consultation

The production of this position statement involved consultation with RMOC members, plus the following:

- Jacqueline Eastwood, Associate Director, NHS London Procurement Partnership
- Mia Small, Nurse Consultant, London North West University Healthcare NHS Trust
- Stephen Hughes, Antimicrobial Pharmacist, Chelsea and Westminster Hospital
- Mark Gilchrist, Consultant Pharmacist Infectious Diseases, Imperial College Healthcare NHS Trust
- Greg Barton, Chair of the Critical Care Group, United Kingdom Clinical Pharmacy Association
- Gema MunozMozas, Lead Vascular Access Nurse, Royal Marsden NHS Foundation Trust
- Rob Lowe, Director Pharmacy Quality Assurance, Specialist Pharmacy Service
The Regional Medicines Optimisation Committee (London) reviewed the evidence base for use of heparinised saline in adults as a solution to lock a central venous catheter line in order to maintain its patency (July 2018 and November 2018). This topic had come to the RMOC from the Medicines Optimisation Priorities Panel.

The RMOC recommends there is no role for routine use of heparinised saline lock for the purpose of maintaining patency of a central venous catheter (CVC) in adults, and that sodium chloride 0.9% is suitable for locking CVCs in the majority of adult patients.

Clinicians caring for people with a CVC in situ should be reminded about the importance of good technique when flushing and locking a central venous access line. Good technique should include maintaining positive pressure to avoid backflow. The Marsden Manual provides a procedure on how to maintain patency of vascular access devices (Chapter 14.2 [link]) [subscription required].

Heparinised saline has a number of disadvantages over sodium chloride 0.9% in this indication. Notably, there is an increased demand on aseptic services already under significant pressure and an increased cost. The provision of prefilled syringes of heparinised saline uses up aseptic capacity that could be used for other products. Using heparinised saline exposes patients to an active medicine that may result in side effects.

**Rationale for recommendation:**

Central venous catheters (CVC) are implanted into people in order to allow frequent administration of medicines and intravenous nutrition. Central Venous Access Device (CVAD) is another term used to describe CVCs. A fluid is injected into a CVC between uses in order to maintain patency. This is known as locking the CVC, which this recommendation relates to. [1] This recommendation does **not** apply to children or neonates, nor to patients who have other vascular access types (e.g. implanted ports, renal dialysis lines).

The Committee was of the view that available evidence that heparinised saline is superior to sodium chloride 0.9% to lock CVCs is of poor quality and, when offset against the risks of use described below, there is not a strong rationale for using heparinised saline over sodium chloride 0.9% to lock CVCs in adults.

This recommendation was made following clinical interpretation of the findings of a Cochrane Review. [1] The meta-analysis found very low-quality evidence to suggest that heparin resulted in fewer CVC occlusions (RR 0.7 [95%CI 0.51 to 0.95], ten studies, 1672 participants). This translated to a number needed to treat to avoid one occluded catheter of 42, with very wide confidence intervals (95%CI 32 to 250 patients). Low-quality evidence found heparinised saline does not have a statistically significant impact on duration of CVC patency (six studies, 1788 participants). No differences between normal saline and heparinised saline were seen for secondary outcomes of sepsis (two studies, 1097
participants), mortality (three studies, 1100 participants), CVC-related thrombosis (three studies, 1527 participants) and haemorrhage (four studies, 1245 participants).

The Committee noted that using heparinised saline has a number of disadvantages over sodium chloride 0.9% in this indication. Notably, there is an increased demand on aseptic services already under significant pressure and an increased cost (approximately £3 day for heparinised saline versus £1 per day for sodium chloride 0.9% injections). The provision of prefilled syringes of heparinised saline uses up aseptic capacity that could be used for other products. Using heparinised saline means exposure to an active medicine that may cause adverse effects such as allergy and bleeding complications.

Good technique when flushing and locking a central venous catheter is important in order to maintain positive pressure and avoid backflow. The Marsden Manual provides a procedure on how to maintain patency of vascular access devices (Chapter 14.2) [subscription required]. [2]

This recommendation is consistent with NICE CG 139 (recommendation 1.4.4.6), which states that “Preferably, a sterile 0.9 percent sodium chloride injection should be used to flush and lock catheter lumens”, [3] and with RCN guidance on maintaining patency of frequently accessed catheter lumens. [4] EPIC3 guidelines for preventing healthcare associated infections recommend “Use sterile normal saline for injection to flush and lock catheter lumens that are accessed frequently. (IVAD34)” [5] The European Society of Clinical Nutrition and Metabolism evidence-based guidelines on chronic intestinal failure in adults make a weak recommendation to use normal saline flushes to prevent CVC occlusion. (Recommendation 97; Grade of evidence: Low”). [6]

This recommendation may differ from advice given by device manufacturers and differs from recommendation 1.4.4.7 in NICE CG 139, which states “When recommended by the manufacturer, implanted ports or opened-ended catheter lumens should be flushed and locked with heparin sodium flush solutions.” A risk benefit assessment should be undertaken if a manufacturer specifically recommends locking with heparinised saline. This risk assessment should include asking the manufacturer for the device-specific evidence (comparing use to sodium chloride 0.9%) for their recommendation.

References


