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# What should be the best dialysis catheter lock in critically ill patients?

Patrick M. Honore\*, Leonel Barreto Gutierrez, Sebastien Redant, Keitiane Kaefer, Andrea Gallerani and David De Bels

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In the recent years, several studies including a meta-analysis have assessed the question concerning the best dialysis catheter lock. We sought to summarize these trials in order to give some guidelines to the clinicians. In a recent meta-analysis, Zhong et al. did not demonstrate any superiority of heparin locked over normal saline for maintaining the patency of central venous catheter including one's dialysis [1]. To avoid catheter occlusion, thrombosis, and catheter-related bloodstream infection (CRBSI), proper flushing and locking are considered to be the primary interventions [2]. A high antimicrobial concentration lock should be used to overcome the relative resistance of bacteria in the catheter biofilm. **Antibiotic locks decrease the risk of long-term hemodialysis infection, but, when used repeatedly, may promote the selection of resistant organisms [3].** Therefore, clinicians were looking to other alternatives such as citrate. Indeed, **citrate concentrated at 1 to 4% exerts only an anticoagulant effect by its ability to chelate calcium [3].** Highly concentrated **citrate up to 46.7% exerts additional effects like the inhibition of catheter colonization [3].** Randomized controlled trials (RCTs) comparing heparin versus citrate lock solutions at 46.7% have been relatively limited [3]. Indeed, **FDA has banned citrate solutions with a concentration higher than 4% because of the accidental risk of major drop in ionized calcium and subsequent cardiac arrest [3].** Nevertheless, Parienti et al. performed a prospective quasi-experimental study comparing **citrate (CL) at 46.7% vs heparin locks or saline [3].** CL was associated with less catheter colonization possibly by **impeding biofilm.** The use of **CL** was also associated with **less catheter dysfunction.** The higher rate of catheter dysfunction found in the saline group as opposed to the CL group was in accordance to Hermite et al. [4]. CL at 46.7% was not associated with higher mortality [3]. However, the **reduction of catheter dysfunction was not**

associated with a **longer catheter duration [3].** Comparing citrate 4% to heparin locks by Quenot et al. [5] found no differences in the duration of event-free survival of the first non-tunneled hemodialysis catheter. Catheter thrombosis, catheter-related infections (CRI), and adverse events were not statistically different between the two groups. In conclusion, **it seems that CL 46.7% should be the best option for dialysis catheter locks in the intensive care unit (ICU).** CL has **less catheter colonization, less catheter dysfunction, but no superior catheter duration [5].** Future RCTs are obviously needed to confirm these findings.

## Abbreviations

CRBSI: Catheter-related bloodstream infection; NS: Normal saline; CVC: Central venous catheter; CRI: Catheter-related infection; RCT: Randomized controlled study; CL: Citrate lock; ICU: Intensive care unit

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\* Correspondence: [Patrick.Honore@CHU-Brugmann.be](mailto:Patrick.Honore@CHU-Brugmann.be)

ICU Department, Centre Hospitalier Universitaire Brugmann-Brugmann University Hospital, Place Arthur Van Gehuchtenplein, 4, 1020 Brussels, Belgium



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