To observe fluid flow patterns and measure recirculation rates of tunneled hemodialysis catheters using a mechanical model that simulates hemodialysis treatment” Vesely and Ravenscroft (2016).

Abstract:

Purpose: To observe fluid flow patterns and measure recirculation rates of tunneled hemodialysis catheters using a mechanical model that simulates hemodialysis treatment.

Materials and methods: Nine tunneled hemodialysis catheters were evaluated using a mechanical model that simulated catheter conditions during a routine hemodialysis treatment. Objective and subjective determinants of catheter performance were measured and compared. Catheters were evaluated with blood lines connected in standard and reversed configurations using a fluid flow rate of 425 ml/min.

Results: With blood lines in standard configuration the Split Cath® was the only catheter to exhibit an atypical fluid flow pattern and significant tip movement. When the blood lines were reversed, three split-tip catheters had significant tip movement. The three step-tip catheters and two symmetric tip catheters had stable fluid flow patterns and no significant tip
movement with blood lines connected in standard and reverse configurations.

The nine catheters had no recirculation when connected in standard configuration. When the blood lines were reversed the percentage of recirculating fluid for symmetric tip, step-tip, and split-tip catheters was 0%, 15% to 20%, and 20% to 30%, respectively. The Equistream®, Palindrome™, and Symetrex catheters had no recirculation with blood lines connected in standard or reversed configurations.

Conclusions: Eight of the nine catheters evaluated in this study performed well with blood lines connected in standard configuration. When blood lines were reversed, symmetric tip and step-tip designs had more stable fluid flow patterns, less tip movement and lower recirculation rates when compared to split-tip designs.

Full Text
Reference:


DOI:10.5301/jva.5000463

Thank you to our partners for supporting IVTEAM