



Intravenous literature: Lapalu, J., Losser, M.R., Albert, O., Levert, A., Villiers, S., Faure, P. and Douard, M.C. (2010) Totally implantable port management: impact of positive pressure during needle withdrawal on catheter tip occlusion (an experimental study). *The Journal of Vascular Access*. Feb 15.

Abstract:

Background: Totally implanted ports (TIP) have become a standard part of patient care, providing long-term central venous access for treatment administration and other procedures. Despite overall the safety and effectiveness of TIP, complications still occur. Negative pressure created during needle withdrawal induces blood reflux and subsequent catheter occlusion. Application of positive pressure during needle withdrawal is thought to largely prevent such reflux, but supporting data are limited.

Purpose of research: To quantify the role of positive pressure, using a test model designed to simulate physiological conditions.

Methods: Reflux associated with needle withdrawal with and without applied positive pressure was tested using various TIP models from different manufacturers mounted on a specially designed test bench. In addition to the presence or absence of positive pressure during needle withdrawal, study variables comprised of needle type (safety and standard), needle gauge and port septum diameter.

Results: Application of positive pressure during needle withdrawal reduced the incidence of reflux during needle withdrawal by nearly 80% (22% vs. 99%, $p < 0.001$). When reflux did occur, the mean residual volume was half that observed without positive pressure. In the absence of positive pressure, mean reflux increased with septum diameter and needle gauge to a statistically significant extent. None of these variables significantly affected reflux in the context of needle withdrawal under positive pressure.

Conclusion: The results of this study support the use of positive pressure during needle withdrawal to prevent blood reflux potentially leading to catheter tip occlusion.

