

PIV failure – how effective is your clinical practice?

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Nurses can expect to care for patients with a peripheral intravenous catheter (PIV) on a daily basis.

Of significant concern however is that up to 69% of PIV may fail before therapy is complete, exposing patients to unacceptable risks.

To improve patient outcomes there is a need to identify patient, and insertion and maintenance factors that can be improved.

A prospective cohort study (including patients aged over 18 years in medical surgical wards) was undertaken in a large tertiary hospital in Queensland Australia between October 2014 and December 2015.

One thousand patients with 1578 PIVs were recruited with 32% (512) of catheters failing (any cause), (136 per 1000 catheter days; 95% CI 125 to 148); including phlebitis 17% (267), occlusion/infiltration 14% (228), and dislodgement 10% (154).

Insertion practices or factors associated failure included:

- Bruising at the insertion site doubled the risk of phlebitis (HR 2.16, 95% CI 1.26-3.71)

- PIV insertion in the pre-hospital setting almost doubled the risk of dislodgement (HR 1.78, 95% CI 1.03-3.06)
- A size 22 gauge catheter increased the risk of occlusion /infiltration by 1.5 (HR 1.43, 95% CI 1.02-2.003), and
- When the PIV was inserted in the patient's dominant side the risk of phlebitis increased 1.5 times (HR 1.39, 95% CI 1.09-1.77).

By contrast the use of secondary securement improved the life of a PIV by halving the risk for all types of failure including:

- Use of non-sterile tape in addition to the primary PIV dressing [Occlusion/infiltration (HR 0.46, 95% CI 0.33-0.63); phlebitis, (HR 0.63, 95% CI 0.48-0.82); dislodgment (HR 0.44, 95% CI 0.31-0.63)]
- An elasticised tubular bandage (occlusion/infiltration HR 0.49, 95% CI 0.35-0.70), and
- Any form of additional securement [occlusion/infiltration (HR 0.35, 95% CI 0.26-0.47; phlebitis (HR 0.53, 95% CI 0.39-0.70); dislodgment (HR 0.32, 95% CI 0.22-0.46).

Two practices increased the risk of PIV failure:

- Intravenous flucloxacillin doubled the risk of both occlusion/infiltration (HR 1.98, 95% CI 1.19-3.310) and phlebitis (HR 2.01, 95% CI 1.26-3.21)
- Frequent PIV access also increased the risk of failure including occlusion /infiltration (HR 1.12, 95% CI 1.04-1.21), phlebitis. (HR 1.14, 95% CI 1.08-1.21) and dislodgment (HR 1.14, 95% CI 1.08-1.21).

Lessons for practice

- To minimise bruising, prior to insertion of a PIV clinicians should evaluate how difficult the procedure may be, and seek assistance or escalate to a more experienced PIV inserter.



- Clinicians must ensure that the PIV is well-secured and protected by correct application of sterile dressing and consider the use of secondary securement.
- To reduce the risk of occlusion/infiltration and phlebitis related to IV flucloxacillin, clinicians should adhere to correct administration regimes. ■



REFLECTIVE QUESTIONS

1. After reading this article, do you feel there are areas for improvement in your clinical area in relation to PIV insertion and maintenance?
2. How do you dress and secure PIVs in your clinical practice? Do you think it is adequate?

Don't forget to make note of your reflections for your record of CPD.

References

- Bausone-Gazda, D., C.A. Lefaiver, and S.A. Walters. Journal of Infusion Nursing, 2010. 33(6): p. 371-84.
- Rickard, C.M., et al., Lancet, 2012. 380(9847): p. 1066-74.
- Webster, J., et al., British Medical Journal, 2008. 337: p. a339.