

Abstract:

Background: Peripheral intravenous catheters (PIVCs) are medical devices used to administer intravenous therapy but can be complicated by soft tissue or bloodstream infection. Monitoring PIVC safety and quality through clinical auditing supports quality infection prevention however is labour intensive. We sought to determine the optimal patient 'number' for clinical audits to inform evidence-based surveillance.

Methods: We studied a dataset of cross-sectional PIVC clinical audits collected over five years (2015-2019) in a large Australian metropolitan hospital. Audits included adult medical, surgical, women's, cancer, emergency and critical care patients, with audit sizes of 69-220 PIVCs. The primary outcome was PIVC complications for one or more patient reported symptom/auditor observed sign of infection or other complications. Complication prevalence and 95% confidence interval (CI) were calculated. We modelled scenarios of low (10%), medium (20%) and high (50%) prevalence estimates against audit sizes of 20, 50, 100, 150, 200, 250, and 300. This was used to develop a decision-making tool to guide audit size.

Results: Of 2274 PIVCs evaluated, 475 (21%) had a complication. Complication prevalence per round varied from 7.8% (95% CI, 4.2-12.9) to 39% (95% CI, 32.0-46.4). Precision improved with larger audit size and lower complication rates. However, precision was not meaningfully improved by auditing >150 patients at a complication rate of 20% (95% CI 13.9%-27.3%), nor >200 patients at a complication rate of 50% (95% CI 42.9%-57.1%).

Conclusion: Audit sizes should be 100 to 250 PIVCs per audit round depending on complication prevalence.

Reference:

Marsh N, Larsen E, Hewer B, Monteagle E, Ware RS, Schults J, Rickard CM. 'How many audits do you really need?': Learnings from 5-years of peripheral intravenous catheter audits. *Infect Dis Health*. 2021 Mar 29:S2468-0451(21)00007-9. doi: 10.1016/j.idh.2021.03.001. Epub ahead of print. PMID: 33795211.