Implementation Study of a Peripheral Intravenous Catheter Bundle at 38 Australian Hospitals

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Purpose/Design

The goal of the study was to implement a peripheral intravenous catheter (PIVC) bundle in a nationwide health service (38 hospitals across Australia), to comply with the Australian Commission on Safety and Quality in Healthcare PIVC *Clinical Care Standard*, promote reliable, consistent care for catheter insertion and management, and reduce preventable adverse events including phlebitis and bloodstream infections.

Methods

A best practice bundle for peripheral catheter insertion and maintenance was developed to ensure care complied with evidence-based practice for all categories of clinicians who insert and care for PIVC.

We developed a new suite of tools to standardize the insertion and maintenance of PIVC across the health service.

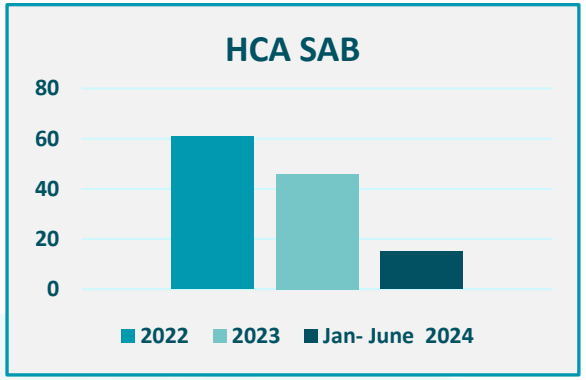
- This included a new policy, new audit tools and a new documentation form, and a review of the current consumer information available for PIVC insertion and management.
- A trial of prefilled saline syringes was also implemented at all the acute care hospitals, to improve compliance with aseptic technique, save clinicians' time, and reduce potential infections.
- A time-and-motion study was conducted to assess the effect of the prefilled saline syringes on clinician workflow.

The bundle was implemented consistently across all hospitals from 2022-2023 with an education roll-out and emphasis on reducing hospital-acquired complications and bloodstream infections.

Results

Staphylococcus aureus bloodstream infection (SABSI) rates fell by 29% from 2022 to 2023 and 66% in 2024 (January – June), with some hospitals reporting no SABSI in the past 24 months.

- All BSI reduced by 12% in 2023 and 68% in 2024 (January – June) since implementation of the PIVC best practice bundle in 2022.
- Documentation has significantly improved by 24% since 2022. Clinical staff, doctors and patients are now more engaged and educated about PIVC management and associated risks. Staff awareness of best practice PIVC management has improved across the health service, with auditing against the *Clinical Care Standard* demonstrating improvement for all 10 quality statements.
- Implementation of prefilled saline syringes demonstrated a 49-second time saving per flush (>280,000 hours annually), greatly improved compliance with aseptic technique.
- improved accuracy of reporting risks, and 55% reduction in phlebitis and local infection.



Conclusion

The cost of one *SABSI* is >AUD $20,000 and our health service's rate has reduced by >50% since the bundle was implemented in 2022. The introduction of standardized PIVC resources has been well received by staff. This clinical practice innovation ensures that reliable consistent care is simple, easy to follow, promotes adherence to best practice, with demonstrated improved patient clinical outcomes and significant savings in staff time. The National Clinical Care Standard provided a framework for clinicians to implement change improvement to comply with national targets and for hospitals to support clinician-driven change in PIVC care.

Limitations

Our Riskman incident reporting system for infections was unable to provide clear data on PIVC failures and to adequately categorise bloodstream infections (hospital-acquired vs community-acquired). In November 2023, the system was rebuilt to reduce the free text options and provide clear reporting templates to clearly and accurately classify healthcare associated infections (HCAI) including the source of the infection and if it was secondary to another HCAI such as a surgical site infection.

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