NHS Supply Chain

From Price to Value: Clinical and Economic Impact of Integrated versus Non-Integrated Peripheral Intravenous Catheters (PIVC) in National Health Service (NHS) Practice

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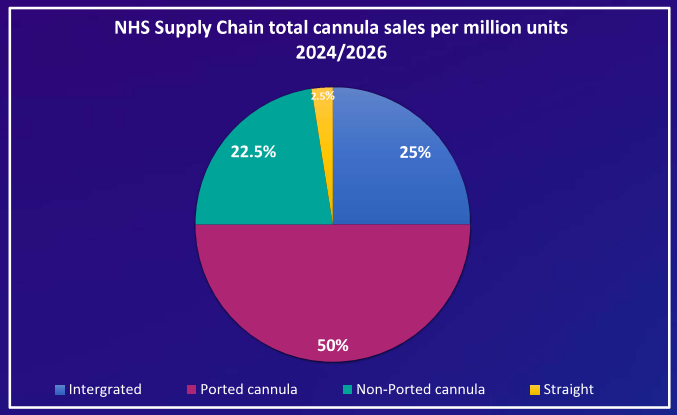
Background

Peripheral intravenous catheters (PIVCs) are widely used across acute NHS settings for administering fluids, medications, and diagnostic agents. Despite their routine use, UK audits continue to show high cannulation rates, particularly in emergency departments where rapid decision-making can lead to reflexive insertion without thorough assessment of clinical need. This contributes to variation in practice, potential overuse, unnecessary procedures, and patient discomfort. Evidence repeatedly shows that PIVC insertion is often driven by habit rather than clear clinical indications, with implications for patient safety and NHS resource use.



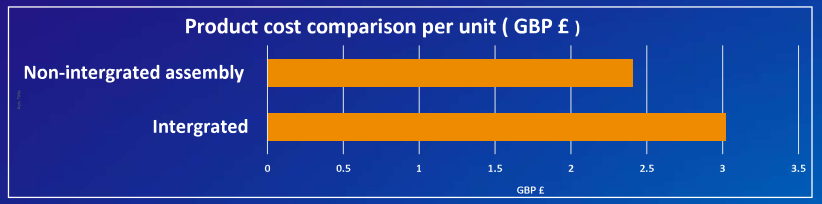
Traditional non-integrated PIVCs require assembly of separate components, adding handling steps, procedure time, and opportunities for contamination or mechanical failure. Integrated PIVCs combine these elements into a pre-assembled, closed system designed to reduce manipulation, streamline workflow, and lower failure risk. Evidence from randomised trials and meta-analyses suggests integrated PIVCs reduce occlusion, infiltration, phlebitis, and dislodgement, and support longer dwell times, potentially reducing re-cannulations. However, higher acquisition costs remain a barrier, highlighting the need for value-based evaluation to assess whether clinical benefits translate into system-wide economic gains.

Aim

The aim to assess the clinical and economic impact of integrated verses non-integrates PIVCs in NHS practice using a value-based, total cost of ownership approach. The analysis examined differences in catheter failure and complications, and whether reduced handling, re-cannulations, and nursing time could offset the higher purchase cost of integrated devices, providing a fuller view of real-world value across a full admission.

Methods

Economic inputs were based on NHS Supply Chain pricing (20G cannula £0.81; needle-free extension £1.60; non-integrated assembly £2.41; integrated PIVC £3.02). Both direct costs (devices and consumables) and indirect costs (nursing time, complications, repeat insertions) were included. Results were reported as disaggregated costs and outcomes in line with NHS value-based procurement principles.



Reduces

- Catheter failure
- Occlusion
- Infiltration/Extravasion
- Phlebitis/ thrombophlebitis
- Dislodgement

Improves

- Dwell Times
- 1st attempt rates
- Number of re-cannulations
- Device manipulations

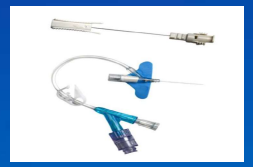
Patient Benefits

- Increased satisfaction
- Reduction in infections risks
- Reduction in PIVC related injuries

Results (Predicted)

Although integrated PIVCs cost 20–30% more per unit, synthesised evidence shows they reduce catheter failure, with a relative risk of ~0.65, and decrease occlusion rates. Trends also indicate longer dwell times and fewer complications. When modelled operationally, integrated PIVCs reduced re-cannulations, patient burden, and nursing time.

These combined benefits offset higher acquisition costs, with the model predicting cost-neutral or cost-saving outcomes under realistic NHS conditions. Evaluating solely on unit cost risks overlooking significant downstream clinical and economic advantages.



Conclusion

Integrated PIVCs, despite higher upfront cost, demonstrate improved safety, reliability, and efficiency. By reducing catheter failure and minimising device manipulation, the support is a more streamlined, patient-centred vascular access process. These benefits lead to fewer therapy interruptions, fewer re-cannulations, and lower nursing workload. When viewed through a total cost of ownership lens, integrated PIVCs deliver better patient outcome, reduced avoidable costs, and align strongly with NHS Value-Based Procurement principles.

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