

# The Hierarchy of Evidence



The Hierarchy of evidence is based on summaries from the National Health and Medical Research Council (2009), the Oxford Centre for Evidence-based Medicine Levels of Evidence (2011) and Melynyk and Fineout-Overholt (2011).

- I Evidence obtained from a systematic review of all relevant randomised control trials.
- II Evidence obtained from at least one well designed randomised control trial.
- III Evidence obtained from well-designed controlled trials without randomisation.
- IV Evidence obtained from well designed cohort studies, case control studies, interrupted time series with a control group, historically controlled studies, interrupted time series without a control group or with case- series
- V Evidence obtained from systematic reviews of descriptive and qualitative studies
- VI Evidence obtained from single descriptive and qualitative studies
- VII Expert opinion from clinicians, authorities and/or reports of expert committees or based on physiology

Melynyk, B. & Fineout-Overholt, E. (2011). Evidence-based practice in nursing & healthcare: A guide to best practice (2nd ed.). Philadelphia: Wolters Kluwer, Lippincott Williams & Wilkins.

National Health and Medical Research Council (2009). NHMRC levels of evidence and grades for recommendations for developers of guidelines (2009). Australian Government: NHMRC. [http://www.nhmrc.gov.au/\\_files\\_nhmrc/file/guidelines/evidence\\_statement\\_form.pdf](http://www.nhmrc.gov.au/_files_nhmrc/file/guidelines/evidence_statement_form.pdf)

OCEBM Levels of Evidence Working Group Oxford (2011).The Oxford 2011 Levels of Evidence. Oxford Centre for Evidence-Based Medicine. <http://www.cebm.net/index.aspx?o=1025>

Databases searched:	<input checked="" type="checkbox"/> CINAHL (Ebsco)	<input checked="" type="checkbox"/> Medline (Ebsco)	<input type="checkbox"/> Pubmed (NLM)	<input type="checkbox"/> Nursing (Ovid)	<input type="checkbox"/> Emcare (Ovid)	<input type="checkbox"/> Other List: _____
Keywords used:	Catheterization, Peripheral, Catheter related complications, Catheter care, Intravenous, Complications,					
Search limits:	Peer reviewed, English, Year Limit >2012					
Other search comments:						

Reference (include title, author, journal title, year of publication, volume and issue, pages)	Evidence level (I-VII)	Key findings, outcomes or recommendations
<p>Australian Commission on Safety and Quality in Health Care (2021) <i>Management of Peripheral Intravenous Catheters Clinical Care Standard</i></p>	<p>VII</p>	<p>Care standards state: A patient with a PIVC will have it removed when it is no longer needed or at the first sign of malfunction or local site complications. Clinical indication replacement may also reduce discomfort for patients associated with regular placement.</p> <p>The device is secured using a sterile, transparent, semipermeable dressing unless contraindicated. Ensure that the dressing remains intact for the duration of the insertion to prevent complications i.e., unintended dislodgement.</p>
<p>Corley, A., Marsh, N., Ullman, A. J., &amp; Rickard, C. M. (2022). Peripheral intravenous catheter securement: An integrative review of contemporary literature around medical adhesive tapes and supplementary securement products. <i>Journal of Clinical Nursing</i></p>	<p>I</p>	<p>The systematic review found that any product used directly at the PIVC insertion site should be sterile. As non-sterile tape directly over the PIVC site is associated with poor PIVC outcomes.</p> <p>Splints and arm boards can be used to immobilise PIVCs, placed at point of flexion such as the wrist or antecubital fossa. However, no studies testing splints or arm boards were identified in the literature.</p> <p>Guidelines recommended tubular over rolled bandages. If a bandage is used to cover the PIVC site, it must be easily removed by nursing staff to perform regular site assessments.</p>
<p>Gorski, L. A., Hallock, D., Kuehn, S. C., Morris, P., Russell, J. M., &amp; Skala, L. C. (2012). Recommendations for frequency of assessment of the short peripheral catheter site. <i>Journal of Infusion Nursing</i>, 35(5), 290-292.</p>	<p>VII</p>	<p>Assess PIVC site hourly for paediatric patients, however patients who are critically ill/sedated or have cognitive defects every 1-2 hours.</p> <p>Site assessment should include redness, tenderness, swelling, drainage, and/or the absence of parathesis, numbness or tingling. Assessment involves visual assessment, palpation and subjective information from the patient.</p>

<p>Gorski, Lisa A., Lynn Hadaway, Mary E. Hagle, Daphne Broadhurst, Simon Clare, Tricia Kleidon, Britt M. Meyer et al. (2021). "Infusion therapy standards of practice." <i>Journal of Infusion Nursing</i> 44, no. S1-S224.</p>	<p>VII</p>	<p>Recommendations include:</p> <p>Assess and discuss daily need of PIVC with treating team.</p> <p>A single tubular sleeve is preferred to a rolled bandage if additional security is required.</p> <p>Use physical immobilisation devices for paediatric patients. Use in a manner that permits visual inspection and assessment of the vascular access site and pathway and does not exert pressure that will cause pressure injuries.</p> <p>Flush PIVC with 0.9% sodium chloride using a pulsatile technique.</p> <p>Use a minimum volume equal to twice the internal volume of the catheter system (catheter plus add on devices). Larger volumes (5ml for PIVC) may remove fibrin deposits, drug precipitate, and other debris from the lumen.</p>
<p>Kleidon, T. M., Keogh, S., Flynn, J., Schults, J., Mihala, G., &amp; Rickard, C. M. (2020). Flushing of peripheral intravenous catheters: A pilot, factorial, randomised controlled trial of high versus low frequency and volume in paediatrics. <i>Journal of Paediatrics and Child Health</i>, 56(1), 22-29.</p>	<p>II</p>	<p>The RCT was a pilot study to inform research protocol and sample size calculations for a definitive trial.</p> <p>PIVC failure was significantly associated with decreased flushing volume, suggesting flush volume is associated with PIVC failure in paediatric patients.</p> <p>Group comparisons for flush frequency indicated that once daily flushing was as good as 6-hourly flushing. Overall analysis of the pilot suggested clinicians could use 10ml flushing volumes every 24 hours; with no PIVC failure or cost.</p>
<p>Rickard, C. M., Marsh, N., Webster, J., Runnegar, N., Larsen, E., McGrail, M. R., ... &amp; Playford, E. G. (2018). Dressings and securements for the prevention of peripheral intravenous catheter failure in adults (SAVE): a pragmatic, randomised controlled, superiority trial. <i>The Lancet</i>, 392(10145), 419-430.</p>	<p>II</p>	<p>The RCT demonstrated that regarding PIVC failure, none of the PIVC dressing or securement interventions tested (tissue adhesive with polyurethane, bordered polyurethane, securement device with polyurethane and polyurethane) were superior to low-cost polyurethane.</p> <p>However, cost should be the main consideration regarding product choice, of which polyurethane is the least expensive option between the four arms.</p>

<p>Webster, J., Osborne, S., Rickard, C. M., &amp; Marsh, N. (2019). Clinically-indicated replacement versus routine replacement of peripheral venous catheters. Cochrane Database of Systematic Reviews, (1).</p>	<p>I</p>	<p>The systematic review demonstrated moderate to low certainty evidence of no clear difference in rates of catheter-related bloodstream infection and thrombophlebitis, between clinically indicated or routine replacement.</p> <p>Moderate certainty evidence that clinically indicated removal probably reduces device-related costs.</p> <p>Results indicate that healthcare organisations should consider policy recommendations that state catheters are changed only if there is a clinical indication to do so.</p>
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