Peripheral intravenous catheter assessment: beyond phlebitis

Essential across clinical specialties, around 2 billion peripheral venous catheters (PVCs) are sold annually worldwide.[1] As a foreign body, PVCs frequently cause phlebitis, and this inflammation is perhaps also the mechanism underlying other common complications of occlusion, infiltration, and even dislodgement. PVCs frequently fail during treatment, with one third to one half removed prematurely because of complications.[2] This removal constitutes substantial health system waste and increases pain, workload, and procedures for replacement devices.

Regular assessment of PVC condition is recommended to detect complications and respond appropriately. Globally, millions of such assessments are documented daily in medical records. Despite its ubiquity, no internationally consistent approach to PVC assessment exists. In fact, one quarter of published studies reporting phlebitis use no instrument or definition at all.[3] By contrast, at least 71 phlebitis scales (and numerous other definitions) exist, but only three have had any psychometric evaluation for validity and reliability, and none comprehensively.[3] Clinically popular approaches, such as the Visual Infusion Phlebitis Score or Infusion Nurses Society Phlebitis Scale, have spawned almost innumerable variants, having been constantly adapted by authors and health services, yet retaining their original names.[3]

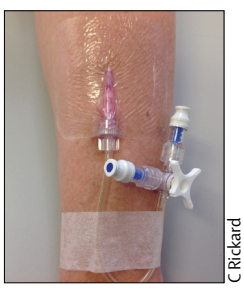
Phlebitis incidence in individual studies has been reported at 0–100%, a major problem for any haematologist seeking to assess the effectiveness of new products or strategies that prevent or treat phlebitis.[4] In *The Lancet Haematology*, Katarina Göransson and colleagues[5] clearly show the reason for this inconsistency. In, to our knowledge, the largest study to date, they systematically and prospectively applied various phlebitis instruments to the same large cohort of adult patients in hospital, showing wildly divergent phlebitis incidence, from none to more than a third of the cohort (34%). These findings accord with previous modelling of clinical trial data using ten phlebitis tools, which found prevalence from less than 2% to more than 20%[4] and negligible-to-poor association of most items within these tools.[6] Goransson and colleagues' PVCs included the typical distribution of sizes and insertion sites, so the results are probably strongly generalisable to most adult patients requiring PVCs.

Goransson and colleagues' work indicates that the energy expended compelling practitioners to assess PVCs and auditing documentation for so-called compliance is largely a waste of resources. They conclude appropriately that the current instruments are almost worthless and argue compellingly that a change is needed. This conclusion aligns well with the knowledge that current monitoring approaches do not prompt health staff to take action on the basis of abnormal assessment findings. A worldwide study[7] highlighted endemic patterns of non-removal of PVCs despite therapy completion, pain, leaking, or other device dysfunction, as well as non-replacement of PVC dressings despite loose, bloodstained, or moist condition.

So, is a PVC monitoring tool needed at all? The answer is yes. Meaningful tools would enable health services to strive for safe, quality care and know if they are achieving this care. A major change in PVC management is that removal is now recommended only for clinical (instead of time-based) criteria—ie, when the PVC treatment is complete, does not work, is not tolerated, has fallen out, is suspected of infection, or was inserted with use of non-aseptic technique.[6,8,9] Consequently, the goalposts for prevention of PVC complications have substantially moved—we should now prevent complications for the potential maximum 29 days of PVCs' licensed indication, not simply for a few days. Thus, valid, reliable methods for PVC assessment are more important than ever, and Goransson and colleagues' work is timely.

Should the myriad of existing tools continue to be compared and further developed, or does tool development need to be started again? Since current tools mainly aim to measure phlebitis (but clearly do it badly), ignore the raft of equally common (occlusion, infiltration, and dislodgement) or more serious (infection) complications than phlebitis, do not address important risk factors (redundant PVCs and poor-quality dressings and securements), and do not always prompt appropriate removal even when phlebitis scores are abnormal, nothing less than a total rethink of PVC monitoring seems to be urgently needed.

A useful and safe PVC is one that the patient still needs, is tolerated (not painful), is free of all complications



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(not just phlebitis), is well dressed and secured, and still works when treatment is due. A useful monitoring instrument is one that captures all of these concepts validly and reliably, is user-friendly, prompts appropriate clinical decision making and action, and enables institutional and health system benchmarking and improvement. Absence of such a quality measure no doubt drives the health system's ongoing inaction to address the staggeringly high prevalence of PVC complications and failure. As to whether or not a specific vein is phlebitic? This question is probably better answered with the portable ultrasound machines now used for difficult PVC insertions than with any current phlebitis tool.[10]

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