

the SAFE Rule in pre-hospital care and emergency and shift operations, in situations where immediate identification of DIVA and the need for technical assistance are crucial; (ii) structured scoring using A-DIVA (outpatient clinics and standard wards) or A-DICAVE (emergency departments) when a formal risk stratification model for initial cannulation failure is desired; and (iii) the DIVA-CP tool in oncology with repeated peripheral chemotherapy.

The practical benefit of identifying a DIVA patient is primarily to utilize the option of ultrasound-guided peripheral venous access insertion or, depending on the treatment, to insert a different type of venous access instead of a PIVC.

The implementation of prediction tools in routine clinical practice in the Czech Republic is influenced by several specific factors. In most healthcare settings, peripheral venous cannulation is primarily the responsibility of general nurses, while access to ultrasound-guided cannulation, the presence of vascular access teams, and standardized escalation algorithms vary considerably between institutions. These differences may limit the transferability of some more complex scales developed in other healthcare systems. The absence of officially translated and validated DIVA prediction tools further underlines the need for systematic selection and adaptation of tools suited to the local clinical context.

From the Czech perspective, there is an urgent need for translation, cultural adaptation, and external multicentre validation of the most promising tools, including the development of local care algorithms with limitations on “blind” attempts, defined indications for ultrasound-guided techniques, and a clear escalation pathway to midline/PICC (Peripherally Inserted Central Catheter)/CVC (Central Venous Catheter)/TIVAD (Totally Implantable Venous Access Device). Implementation should go hand in hand with point-of-care ultrasound training programmes for non-medical personnel, since technical availability and operator skill are key to success. Current research by Pratec et al. shows that the use of imaging technologies – particularly ultrasound – significantly increases cannulation success rates in DIVA patients on the very first attempt and reduces the number of failed punctures. These data support the necessity of routinely introducing modern assistive technologies during cannulation, because without them, the likelihood of failure is significantly higher in DIVA patients [14]. Recognizing DIVA risk is also considered key by the INS (Infusion Nurses Society), particularly in patients with a history of repeated failed punctures, obesity, chronic disease, or poor visibility/palpability. For DIVA prediction, they recommend using validated assessment tools, available EMR (Electronic Medical Records), and vein visualization technology (ultrasound, NIR – Near Infrared Light), as they improve first-attempt success and reduce complications in DIVA patients. Special attention is paid to the creation of Vascular Access Specialist Teams (VAST). The INS emphasizes competent personnel, regular professional preparation, and simulation training, since caring for adult DIVA patients requires highly specialized skills [13].

Recommendations are also presented by other professional authorities, e.g., the AVATAR Group (Alliance for Vascular Access Teaching & Research) which promotes an “umbrella” overview of

international guidelines in venous access and emphasizes the implementation of ultrasound-guided cannulation as the preferred strategy in DIVA, and the use of algorithms for the correct indication of peripheral (including midline) vs. central access with an emphasis on preserving vessel quality (“vessel health & preservation”) [15]. The effectiveness of predictive tools, the use of ultrasound as a preferred method for DIVA patients including systematic training in ultrasound techniques, and the necessity of further research are highlighted by the current literature review by Dewi and Astrid [16].

The implementation of predictive scales into the clinical environment can lead not only to a reduction in the number of unsuccessful venipunctures and related complications, but also brings a medico-economic benefit by reducing staff workload, material costs, and the time needed to secure venous access. The ALCOV study points out that DIVA patients represent a significant economic burden due to more frequent complications, repeated procedures, and delayed initiation of treatment, underscoring the need for systematic prediction. The introduction of a standardized algorithm based on a predictive scale can therefore mean not only increased patient safety and comfort, but also more efficient use of healthcare facility resources [17].

Recommendations for Future Research

In the future, we consider the following as priorities: (1) Translation and transcultural external multicentre validation of all the above-mentioned tools; (2) Development of unified, clinically derived cut-off values and risk categories for scales that lack them, including prospective testing of the impact on care outcomes (initial cannulation success rate, extravasation, pain, treatment delay time); (3) Consideration of methodological adjustment of DIVA-CP: converting binary items to ordinal scales, using appropriate correlation techniques, and more comprehensive verification of internal structure; (4) Implementation studies evaluating the cost-effectiveness of algorithms that combine screening/scoring with limits on the number of attempts and an approach utilizing early ultrasound-guided cannulation; and (5) Inter-rater reliability studies among novice and experienced nurses.

Conclusion

This study confirms that there is no unified “gold standard” for all clinical environmental and situations. At the same time, it confirms that early prediction and ultrasound-guided cannulation as a first choice are consistently establishing themselves for adult DIVA patients. The selected scales (A-DIVA, EA-DIVA, A-DICAVE, DIVA-CP) and the SAFE Rule provide a usable framework for screening and risk stratification, but require local translation, cultural adaptation, and external validation. Consensus across international authorities points towards algorithms limiting blind attempts, rapid escalation to the creation of a “Vascular Access Specialist Team”, and a rational choice of vascular access with an emphasis on vessel health & preservation. Implementation must be built on staff competency, measurement of quality indicators, and technology availability (US/NIR). In the Czech context, the already ongoing translation and validation of the most promising tools (A-DIVA, SAFE Rule, and A-DICAVE) is a realistic step forward.