

A-DIVA (Adult Difficult Intravenous Access Scale)

A-DIVA was developed for the early identification of DIVA patients in a population of adult surgical patients in 2016 by van Loon et al. In 2019, it was modified and externally validated in a multicentre setting across five hospitals in the Netherlands. The scale was designed as a rapid, clinically easy-to-use tool for the prospective identification of adult patients at risk of difficult peripheral cannulation. Structurally, it is an additive score based on a binary evaluation of five clinical items (0/1 point), the sum of which (0–5) quantifies the risk of failure on the initial cannulation attempt.

The 2019 modification (see Table 3) refined the predictors in a broad adult patient population ($n = 3587$) without restrictions based on PIVC indication, demographics, or medical history. The study's outputs confirm five key predictors and thus the structure of the modified A-DIVA. External validation showed that the scale is reproducible across hospitals and clinical situations. The scale has very high sensitivity and specificity [2, 5, 7].

Its main positive aspect is its good predictive power and applicability in various clinical settings. From a user's perspective, it is a simple tool with clear scaling and evaluation. A negative aspect is the fact that the prediction relates primarily to the initial attempt at peripheral cannulation. Multiple failures are not the direct subject of the model, nor is the adequate procedure for managing the given findings. Measuring a vein diameter of < 3 mm is perceived as a user-unfriendly factor. To obtain an accurate result, it is necessary to use a ruler, which is often perceived by nurses as cumbersome. Another problem might be the "expected difficult cannulation" item which is based on subjective clinical estimation, which can lead to inter-rater variability [5].

The practical application of the A-DIVA score is in environments where repeated attempts by healthcare professionals of varying experience are common. We recommend supplementing the score with a local algorithm limiting the number of "blind" attempts and prioritizing early ultrasound assistance. The expert team, drawing on the analogy of the results, calls for the use of ultrasound in patients with moderate and high DIVA risk. Furthermore, they emphasize the necessity of training and education, particularly for non-medical healthcare personnel, in working with ultrasound. Given that the A-DIVA tool is the most frequently used instrument in the clinical setting, it is more than desirable to perform translation and validation in the CR. Subsequently, specific steps in the care of individual DIVA patient risk groups should be established.

EA-DIVA score (Enhanced Adult DIVA score)

EA-DIVA is the result of a study by Civetta and colleagues. Their goal was to develop and validate a predictive scale that enables the identification of adult patients at risk of DIVA during preoperative assessment. The research was conducted in surgical departments of one Italian hospital on patients ($n = 1006$) prior to urgent and elective surgeries.

The EA-DIVA score (Table 4) is an eight-item validated scale with heterogeneous point weighting. Individual factors are again formulated as YES/NO questions with different response weights. In terms of risk, the conclusion is that if a patient scores 8 or more points, they

are classified as high risk, and one should automatically proceed to more advanced cannulation techniques, particularly ultrasound-guided cannulation [8].

The main positives of the EA-DIVA scale are its high accuracy, comprehensiveness, and rapid applicability. Its eight clearly defined criteria demonstrate a high predictive value. The scale has high sensitivity and specificity as well as the potential to be used in a wider range of clinical settings, such as emergency medicine or pre-hospital care. A perceived negative is the fact that it was validated only on adult patient population of a single healthcare facility. For widespread application in clinical practice, it would be appropriate to conduct external validation in more hospitals, regions, countries, or cultures.

The question is whether it can be perceived as a pitfall that two of the scoring items (skin assessment and vein assessment) are subjective in nature, meaning that the EA-DIVA results can be somewhat dependent on the experience of the specific healthcare professional assessing the patient. In practice, this can lead to variability between departments and between individual raters. A higher number of evaluated factors may also be perceived as cumbersome by nurses. For the reasons mentioned above, the expert team *does not recommend* the scale for translation and validation in the Czech setting.

SAFE Rule

The SAFE Rule was created in 2024 by Bahl et al. as the output of an extensive systematic literature review and multivariable meta-analysis, which identified the most consistent and strongest predictors of DIVA across available studies. Its aim was to unify disparate findings from 20 studies and replace the missing unified definition of DIVA with a simple, quickly applicable clinical rule. The result is the mnemonic tool SAFE – See, Ask, Feel, Evaluate BMI (Body Mass Index), based on the five most significant risk factors: invisible veins, DIVA history and intravenous drug abuse history, impalpable veins, and BMI > 30 .

- **S (See):** Are there any suitable veins visible on the extremity?
- **A (Ask):** Does the patient have a history of difficult cannulation or intravenous drug use?
- **F (Feel):** Are there any suitable veins palpable on the extremity?
- **E (Evaluate BMI):** Is the patient obese with a BMI higher than 30 (obesity)? [3]

The main positive of the SAFE Rule is its simple and quick use compared to more complex scoring systems, which can be more time-consuming in practice. It focuses only on the main risk factors, supported by evidence-based practice. Similar to the other scales, it helps detect DIVA patients even before the first puncture, which can significantly reduce the number of unsuccessful attempts, thus decreasing pain, anxiety, and depletion of the venous bed. Furthermore, the SAFE Rule is suitable for broad use across the patient population.

A negative aspect is the fact that the SAFE Rule itself has not yet been clinically validated as a fully-fledged predictive tool. Given that individual factors are not weighted (do not have assigned points), SAFE is a screening rule, not a scoring tool. It lacks scoring, patient stratification, and subsequent care rules. Similar to EA-DIVA, vein