

The research relied exclusively on published data and professional opinions of the experts. It did not involve patients or any personal data and, therefore, did not require ethical approval under national regulations.

Results

In this section, the results of the systematic literature search and the expert assessment of the five selected prediction tools intended for identifying adult DIVA patients are presented. The chapter offers an overview of their structural parameters, validation data, and clinical

relevance, thus forming the basis for the subsequent discussion about their implementation potential in Czech clinical practice.

A clear description and comparison of citations, validation, sensitivity/specificity, whether the scale includes an algorithm/procedure for securing venous access in DIVA patients, and the validation of the scale in the CR is described in Table 1. Table 2 describes the individual monitored parameters of the selected scales, and Tables 3–6 are free translations of the selected predictive scales. The following text is a commentary on all of the above.

Tab. 1. Basic Characteristics of Predictive Scales

	A-DIVA (2019)	EA-DIVA (2019)	SAFE Rule (2024)	A-DICAVE (2022)	DIVA-CP (2016)
WoS/Scopus Citations	90/105	32/36	7/9	9/12	25/33
Validation	External	Internal	---	Internal	Internal (pilot)
Specificity/Sensitivity	Significant OR (OR: 2.6–5.9)	85.5% / 89.2% PPV: 56% NPV: 97.5% AUC (ROC): 0.94	---	93.75% / 78.99% AUC: 0.91	
Next-Step Algorithm	NO	YES	NO	NO	NO
Translation & Validation in the Czech Republic	NO	NO	NO	NO	NO

Tab. 2. Individual DIVA Prediction Factors Assessed in Selected Scales

DIVA factors	A-DIVA	EA-DIVA	SAFE Rule	A-DICAVE	DIVA-CP
DIVA history	YES	YES	YES	YES	NO
Expected Failed Cannulation	YES	NO	NO	NO	NO
Vein Palpability UE	YES	YES	YES	YES	YES
Vein Visibility UE	YES	YES	YES	YES	YES
Mean Vein Diameter UE	YES	NO	NO	NO	YES
Vein Mobility/Fragility	NO	YES	NO	NO	YES
Coagulation Disorder	NO	YES	NO	NO	NO
Insufficient Peripheral Veins (Chemotherapy, IV Drug Abuse, Frequent Venipunctures)	NO	YES	YES (IV Drug Abuse)	NO	YES (Frequent Venipunctures)
Neurovascular Disease	NO	YES	NO	NO	NO
Skin Quality Assessment	NO	YES	NO	NO	NO
Overweight (BMI)	NO	YES	YES	NO	NO
One-side Only Vein Availability	NO	YES	NO	NO	YES
Vein Quality	NO		NO	NO	YES
Chemotherapy Type	NO	NO	NO	NO	YES
Scale Range	0–5	0–13	0–4	0–5	0–11
Interpretation	0–1 low risk 2–3 moderate risk 4–5 high risk	≥ 8 high risk	---	0–2 easy cannulation 3–5 difficult cannulation	

Definitions: UE – Upper extremity, BMI – Body mass index, IV – intravenous

Tab. 3. A-DIVA SCALE [5]

Risk factor	Score
Is there a known history of a difficult intravenous access?	1
Do you expect a failed first attempt at cannulation?	1
Is there an inability to identify a dilated vein by palpating the upper extremity?	1
Is there an inability to identify a dilated vein by visualizing the upper extremity?	1
Has the largest dilated vein a diameter of less than 3 millimetres?	1
A-DIVA score	First-attempt failure rates
0 – 1	Low (4%)
2 – 3	Moderate (37%)
4 – 5	High (94%)

Tab. 4. A-DICAVE [9]

Criteria	Body
History of difficult peripheral venous cannulation	3
Vascular depletion (previous use of chemotherapeutic agents, intravenous drug abuse, previous venipunctures)	2
Coagulative disorder and/or intake of anticoagulant or antiplatelet drugs	2
Neurovascular disease Peripheral neuropathy and/or vasculopathy	1
Dark, thick, or fragile skin	1
Overweight (BMI > 25)	1
Vein evaluation (not visible, not palpable, rolling, or winding vein)	2
One-side only vein availability	1