DIVA (Difficult Intravenous vascular access) Scales: What has worked and What has not

Introduction:
DIVA (difficult venous access) is the hot topic of the last five years. Definitions have been established for DIVA by vonLoon (2018), Bell & Moureau (2023) and Bahl (2021,2024). Several meta-analysis and systematic reviews have been published, on not only the definition of DIV; but the impact of DIVA identification tools by vonLoon (2018 with eight studies), Bell & Moureau (2023) and Zaki (2025 with fourteen studies). The INS Standards (2024) indicates that a population-specific tool to guide early referral might be useful but further research determines the generalizability of the tool. So where are we at with a tool?

Rate of DIVA published literature
Basic facts DIVA

Author	Year	Service	Results
Huang	2023	ER requiring USGPIV	5.8% missed attempts
Shokoohi	2020	ER requiring USGPIV	3.25% by missed attempts
Civetta	2019	Surgery	12.6% by tool
Rodriguez-Calero	2020	Inpatient	8.3% missed attempts
Fields	2014	ER	11.8% missed attempts
Salleras-Duran	2020	ER	24% by tool
Sweeny	2022	ER	24.9% by tool

Success rate Diva: VanLoon (2018)

- Systematic review
- Meta Analysis
- (2000-2017)
- 8 articles
- 1,660 sticks
- Success rate no ultrasound 30% for DIVA*

* *Based on first attempt succession rates
* Known or predicted DIVA cases

- Presence of DIVA results in significant delays in ER
  - 37 minutes for admission orders
  - 29 minutes for lab results
  - 50 minutes for pain meds
  - 36 minutes of IV fluids
  - 56 minutes for IV contrast
  - 87 minutes for discharge orders

Shokoohi (2020)

Who is a DIVA in literature

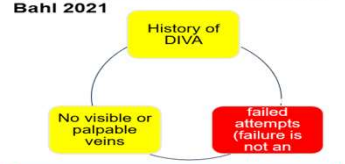
Who is the DIVA in published studies? Zaki (2025)

Author	Type of study design	Country	Diva patient
Bahl (2016)	Prospective RCT	USA	✓ History difficult stick ✓ 2 failed PIV access ✓ History end state renal disease
Bauman (2009)	Prospective cohort	France	✓ 2 failed PIV attempts
Benkhadra (2012)	Prospective RCT	France	✓ 2 No visible or palpable veins
Brdey (2018)	Prospective RCT	France	✓ ICU no longer needs CICC ✓ BMI >30 ✓ Fluid overload ✓ History IV drug abuse ✓ History chemotherapy
Constantino (2005)	Prospective RCT	USA	✓ 3 failed attempts ✓ Obesity ✓ History IV drug abuse ✓ Chronic medical conditions
D'allesandro (2024)	Prospective Observational cohort	Italy	✓ >3 attempts ✓ DIVA score >4

Systematic review and meta-analysis of 15 studies and 1,485 patients

Author	Type of study design	Country	Diva patient
Doniger (2009)	Prospective RCT	USA	✓ 2 failed attempts ✓ History difficult access
Ismailogu (2015)	Descriptive study	Turkey	✓ ICU no CICC needed ✓ Obesity ✓ Peripheral edema ✓ Dehydration ✓ Chronic diseases
McCarthy (2016)	RCT	USA	✓ History difficult access
Rodriquez Herrara (2022)	Case control	Spain	✓ No palpable or visible veins
Stein (2019)	Prospective	USA	✓ 2 failed attempts
Vinograd (2019)	Prospective RCT	NR	✓ History difficult IV validated
Weiner (2013)	Prospective RCT	USA	✓ 2 failed attempts ✓ History difficult access
Yancili (2022)	Prospective RCT	Turkey	✓ No palpable visible veins ✓ History of difficult access

First study on definition of DIVA Bahl 2021



Way too basic
Not proactive
Based on emergent access
Potential tool for escalation

DIVA selected published tools

Proactive DIVA scoring tool by Bell & Mourea(2023)

Score	Visual Appearance	Palpable Sites	History of Difficult Access	Clinical Factors
0	Many visible veins	Many palpable veins	No difficulty	Not applicable
1	Few visible veins	Few palpable veins	Reported difficulty or recent missed attempts	Pediatric patients; Urgent conditions (ESI 3-4)
2	No visible veins	No palpable veins	History of major difficulty as evidenced by previous central lines or PICCs	Comorbidities, Emergency conditions (ESI 1-2)
SUM	Write score here	Write score here	Write score here	Write score here

Score	Risk	Action	Instructions for Use
0-3	Low	Obtain IV access	• An objective scoring tool to determine best course of action to obtain appropriate vascular access. • Scores is additive. • Give 0-2 points on each category for a overall score of 0-8.
4-5	Medium	Obtain access with competent practitioner; consider VAS® consult	
6-8	High	Consider emergency intervention (CVC, IO); consult VAS immediately	

• C-DIVA score is a modification of the A-DIVA Scale (van Loon, 2016)
• Goal is to obtain the "Right IV" (Sloane, 2019)
• Vascular Access Specialists (VAS) are trained to utilize US in placement of an IV.

Bell, Jon & Moureau, Nancy & Campos, Cheryl. (2023). Validation and Reliability of the Comprehensive Difficult IV Access Scoring Tool. 6. 10.29011/2688-9501.101414
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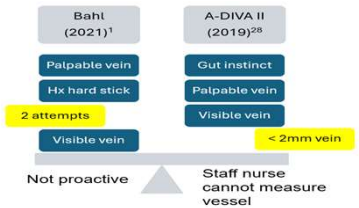
A-DIVA II: VanLoon (2019)
Adult Intravenous Access Scale

Variables	Score
Is there a known history of a difficult intravenous access?	1
Do you expect a failed first attempt or a difficult intravenous access?	1
Is there an inability to identify a dilated vein by palpating the upper extremity?	1
Is the patient at an emergency indication for surgery	1
Is there an inability to identify a dilated vein by visualizing the upper extremity?	1
Has the largest dilated vein a diameter less than 3 millimeters?	1

A-DIVA scale implies the prediction of the likelihood of a difficult intravenous access in adult patients prospectively based on clinical observations, and consisted of six variables



Bahl (2025) New improved DIVA tool

The DIVA escalation formula

Should this be part of the DIVA assessment?

DIVA studies based on emergent patient
But what about the non emergent patient?

- What is the infusate?
- How long is the therapy?
- Who is the patient?

The basic questions to vascular access plaining
What device will take me to the end of therapy with one stick?

Summary

- DIVA identification in emergent situations can improve patient flow and reduce costs
- Waiting to escalate the patient after 2 > missed attempt is a failed definition for DIVA
- Non palpable and nonvisible veins is a key factor to DIVA identification
- Patient history of poor access is a key factor
- The SAFE program by Bahl is an easy proactive approach to identification of DIVA
- DIVA in non emergent situations must have patient assessment for the best vascular access device as an add on
- The Dav-expert algorithm is a very helpful tool to add to the Safe Program
- The most accurate predictor for escalation and identification of DIVA is the clinicians gut feeling on successful venipuncture

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