PREPROCEDURAL ULTRASOUND:
Optimizing vein selection & catheter sizing

VYGON
Value Life

2. The Catheter-to-Vein Ratio: A Key Determinant of Outcomes

Once the most suitable vein has been selected, it is essential to choose the most appropriate device for that vessel:

Venous blood flow decreases as catheter occupancy increases.

The **catheter-to-vein ratio (CVR)** is identified as a **major risk factor** for catheter-related **thrombosis**.

Selecting a catheter appropriately sized to the target vein is critical!

KEY RECOMMENDATIONS

Use the **smallest catheter** suitable for therapy.

Catheter external diameter should not exceed 1/3 of vein diameter.

CATHETER-TO-VEIN RATIO ≤ 1/3 (CVR ≤33%)

If a **1:3 ratio cannot be achieved**, CVR should **never exceed 45%** of the vein lumen.

Choose the appropriate catheter size:

Vein diameter		Recommended catheter size
1 mm	0.74 mm	1 Fr
2 mm	1.48 mm	2 Fr
3 mm	2.22 mm	3 Fr
4 mm	2.96 mm	4 Fr

33%: Ideal CVR 45%: Maximum CVR, not to exceed

PERIPHERAL VEINS DIAMETER*

	Basilic	Brachial	Saphenous	Axillary
Mean Ø*	**1,0 mm**	**1,05 mm**	**1,3 mm**	**1,6 mm**
Range of Ø*	(0,7 - 1,3)	(0,8 - 1,5)	(0,8 - 1,8)	(1,2 - 2,0)

CENTRAL VEINS DIAMETER*

	External jugular	Subclavian	Axillary (chest)	Femoral	Internal jugular	Brachiocephalic
Mean Ø*	**1,35 mm**	**1,8 mm**	**1,95 mm**	**2,3 mm**	**3,15 mm**	**3,55 mm**
Range of Ø*	(0,9 - 1,7)	(1,1 - 2,5)	(1,5 - 2,5)	(1,4 - 3,1)	(2,4 - 4,3)	(3,0 - 4,5)

* Based on measurements of the vein diameters in infants weighing from 500 g to 3 Kg.

Barone G, D'Andrea V, Vento G, Pittiruti M. A Systematic Ultrasound Evaluation of the Diameter of Deep Veins in the Newborn: Results and Implications for Clinical Practice. Neonatology. 2019.
NANN. Peripherally Inserted Central Catheters: Guideline for Practice, 4th Edition, 2022