

Catheter to Vessel Ratio for Peripherally Inserted Central Catheters (PICCs) & Ultrasound Guided Peripheral Intravenous (USGPIV) Insertions

Vessel Size (mm)	1.5	1.75	2.0	2.25	2.5	2.75	3.0	3.25	3.5	3.75	4.0	4.25	4.5	5.0	5.25	
Catheter Size																
24g.	49%	42%	37%	32%												
22g.			45%	40%	36%	33%										Legend
20g.				49%	44%	40%	37%	34%	32%							≥46%
18g.						49%	45%	41%	38%	36%	33.5%					45-34%
3Fr.			47%	42%	38%	34%	32%									≤33%
4Fr.							48%	44%	41%	38%	36%	34%	32%			
5Fr.										46%	43%	41%	38%	35%	33%	

Measure **diameter** of vein prior to insertion with ultrasound to ensure catheter-to-vein ratio is equal to, or less than, **45%**. Consider catheter-to-vein ratio equal to, or less than, **33% especially in patient with cancer diagnosis or hypercoagulopathy**. If vein is of inadequate size, plan for alternative access.
(Canadian Vascular Access and Infusion Therapy Guidelines, 2019, pg.22)

Catheter Size	Outer Diameter
24g.	0.73mm
22g.	0.91mm
20g.	1.11mm
18g.	1.34mm
3Fr.	0.95mm
4Fr.	1.43mm
5Fr.	1.73mm

Calculations in chart are based off of this equation –

$$\% \text{ Occupied (Diameter)} = \frac{\text{Diameter of Catheter}}{\text{Diameter of vessel Occupancy Circle}} \times 100$$

**Catheter to Vessel Ratio (CVR) for Peripheral IVs
(CVR less than 45%)**

Catheter size	Vessel size
22g	Greater than 2.0mm
20g	Greater than 2.5mm
18g	Greater than 3.0mm

*Resources received from BD Vascular Access Specialist June 2023