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Choosing Catheter Sheath Introducers in Infants – Information You Are Not Provided but Should Have!

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Background

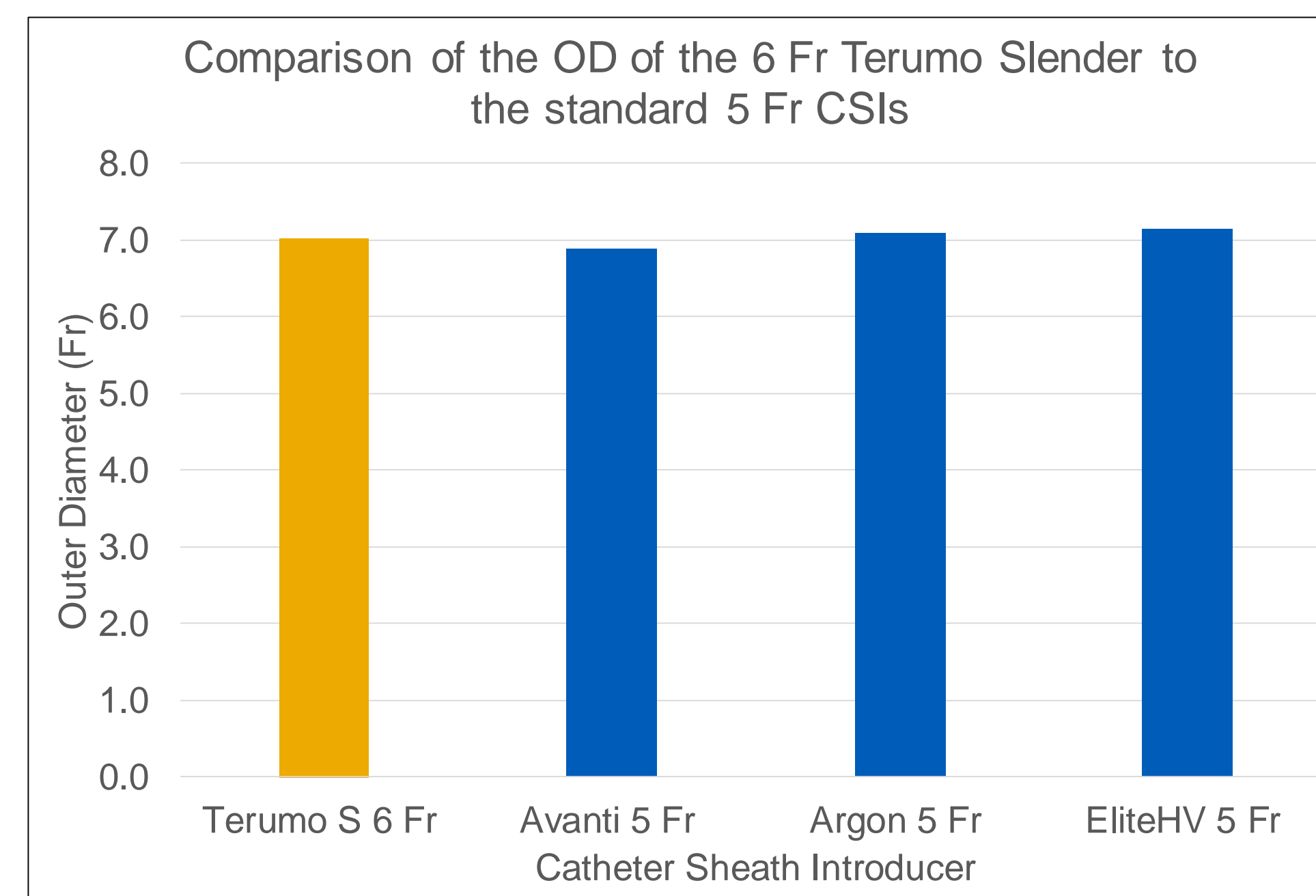
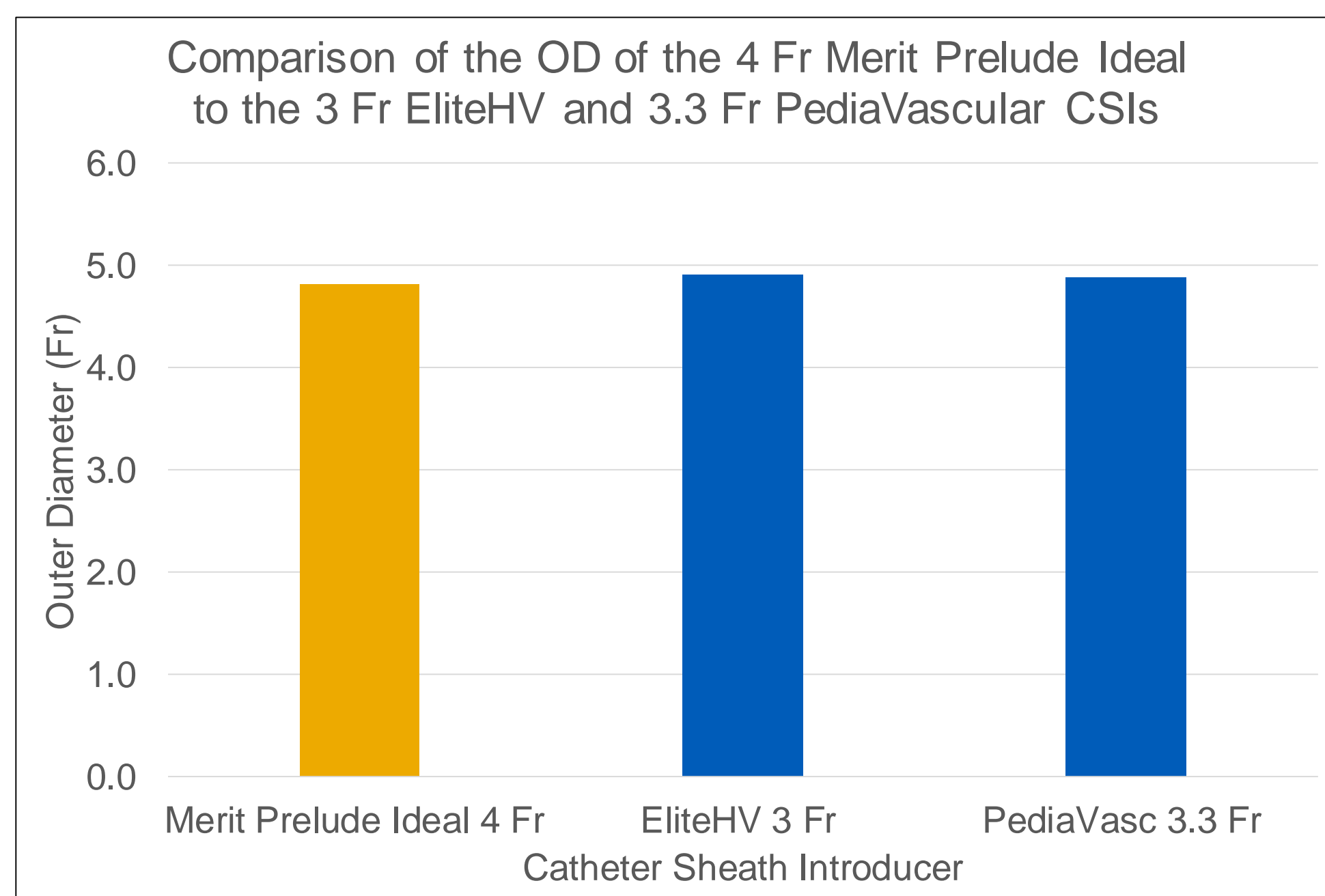
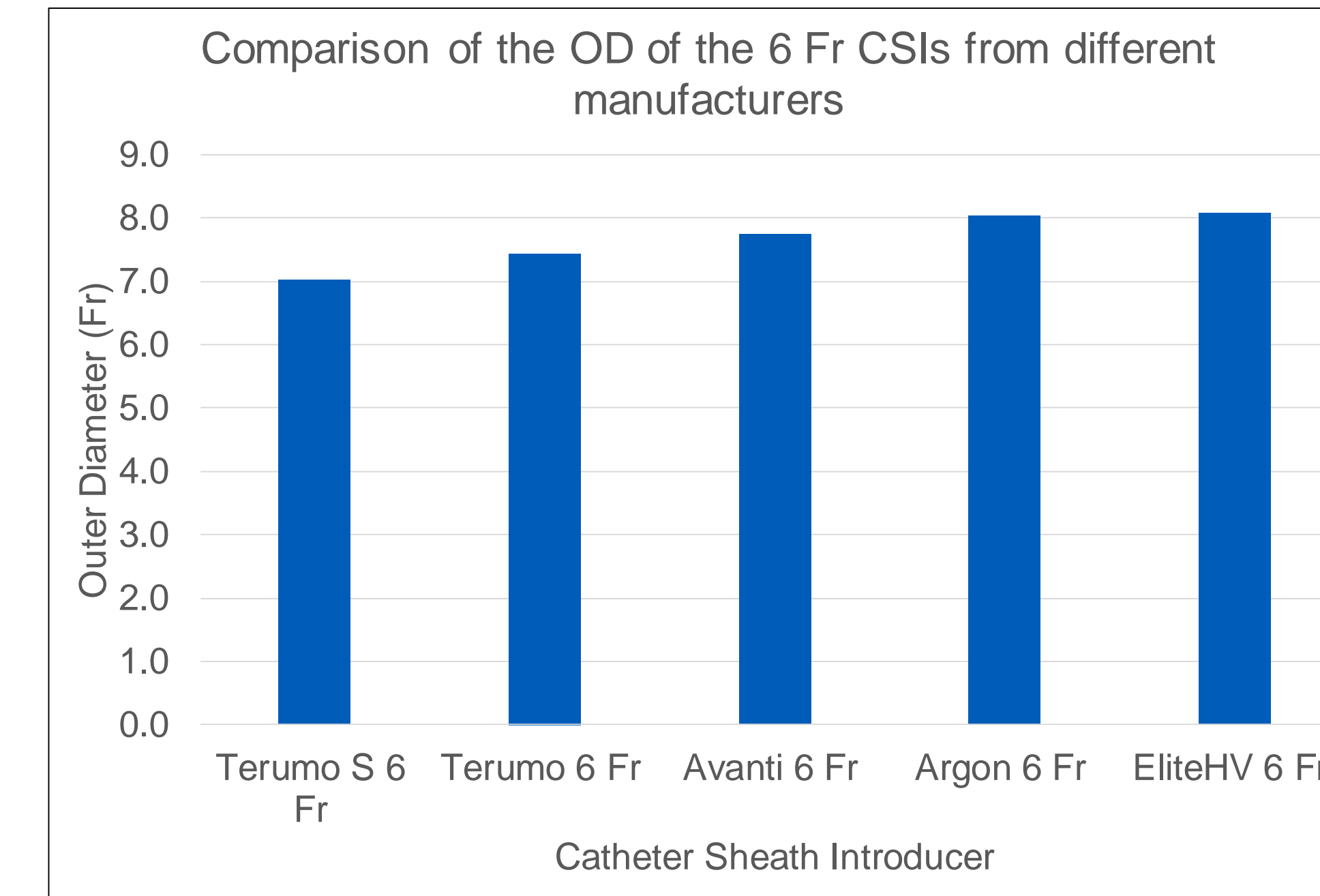
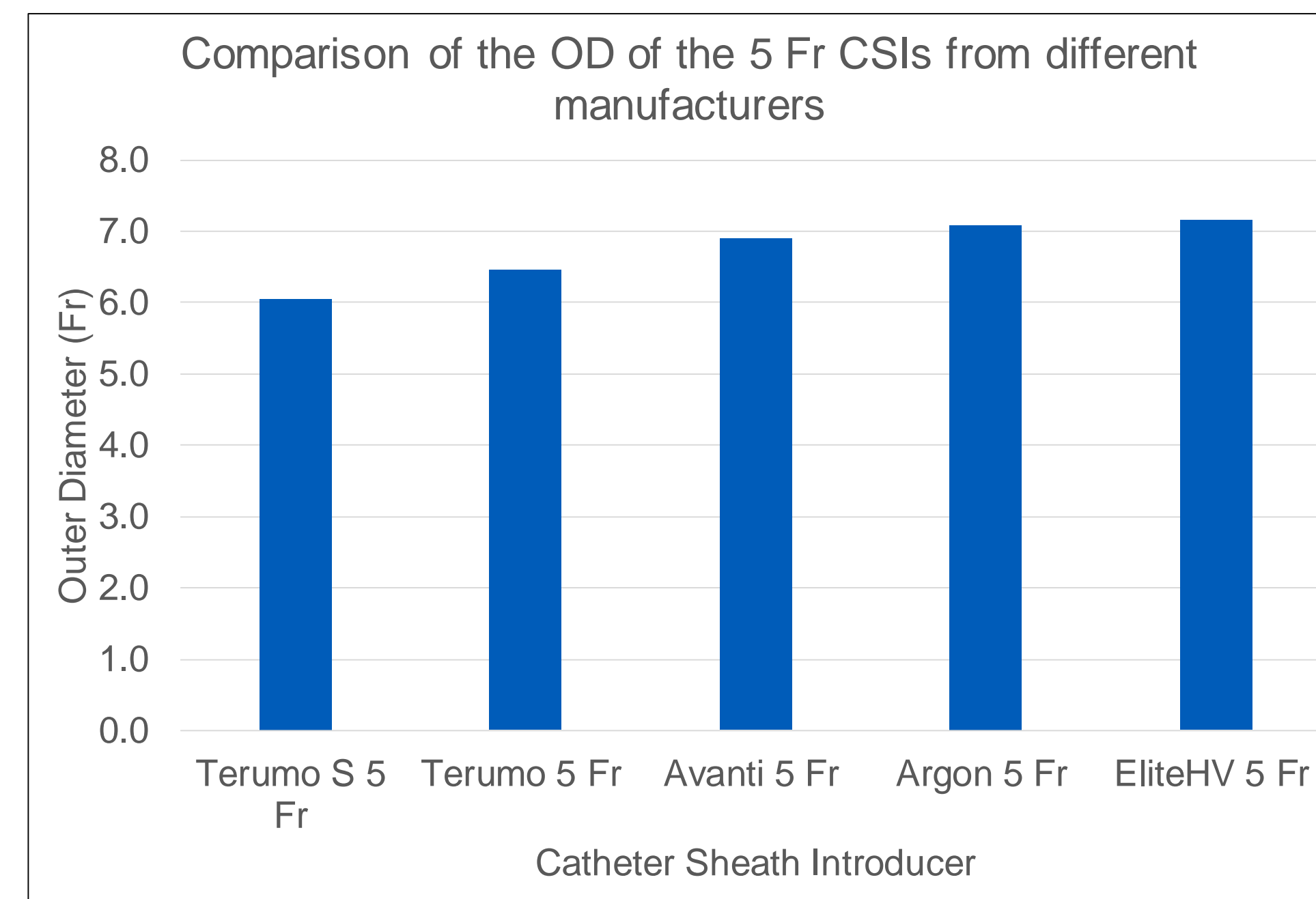
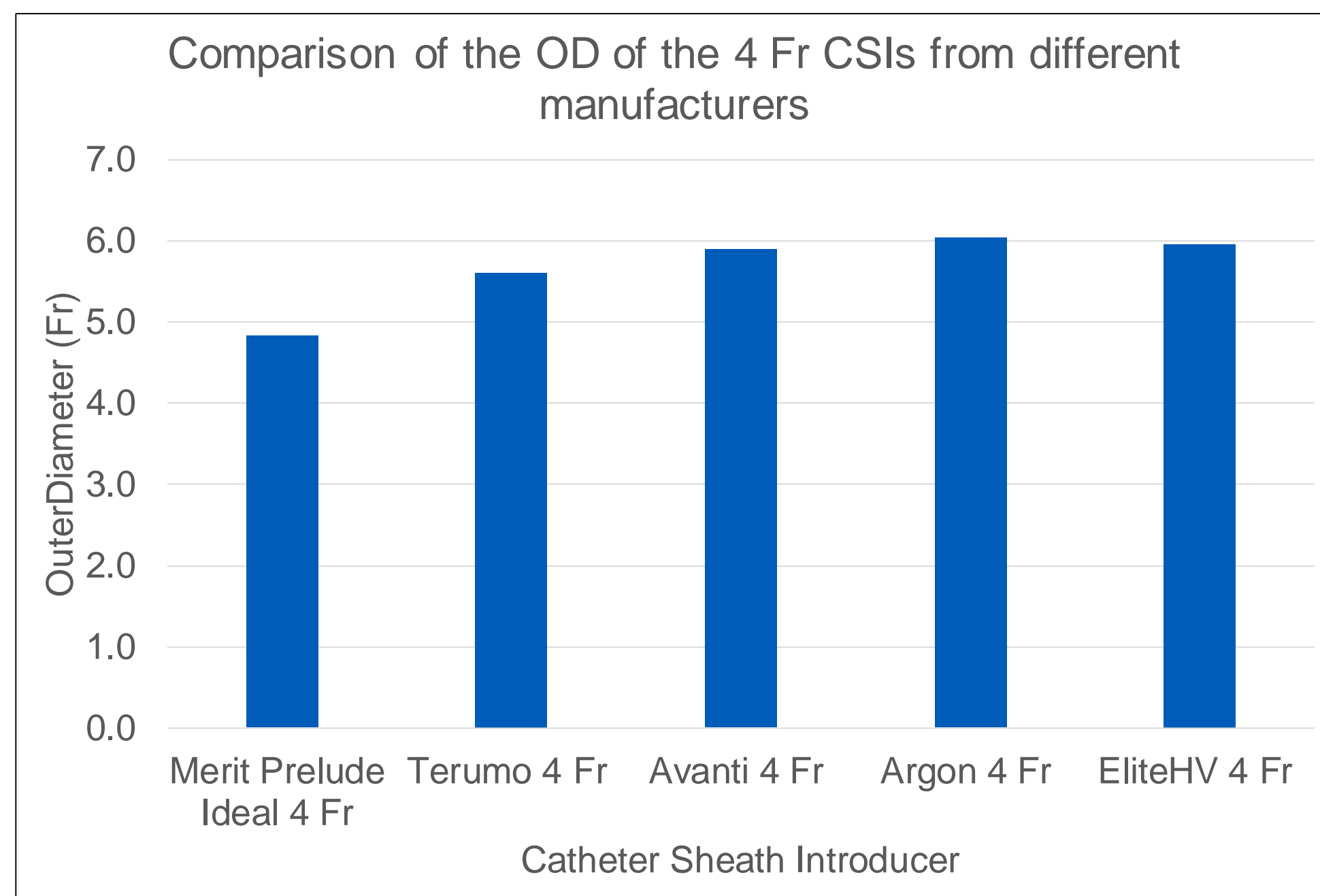
- The advertised catheter sheath introducer (CSI) size, which represents the internal diameter (ID), defines the maximum size of medical devices that can pass through it
- The outer diameter (OD) determines the risk of vascular injury but varies considerably between manufacturers and is not advertised.

Methods

- The OD of 3, 3.3, 4, 5, and 6 French (Fr) CSIs (5 of each size) from different manufacturers were measured, with the dilator in place, using a Mitutoyo Digital Micrometer
- All authors performed 3 measurements at mid and proximal CSI for a total of 6 measurements per sheath
- Mid and proximal portions were compared using an independent samples T test
- Cronbach's alpha and intraclass correlation coefficient (ICC) were used to measure the agreement between authors with $p < 0.05$

Results

- There was no difference between mid and proximal measurements ($p < 0.05$)
- Cronbach's Alpha and ICC were both 1.0, consistent with excellent inter-author measurement agreement



CSI Type	Mean OD (mm)	Mean OD (Fr)
Terumo S 5 Fr	2.019	6.1
Terumo S 6 Fr	2.341	7.0
Terumo 4 Fr	1.869	5.6
Terumo 5 Fr	2.153	6.5
Terumo 6 Fr	2.479	7.4
Merit Prelude Ideal 4 Fr	1.608	4.8
EliteHV 3 Fr	1.635	4.6
EliteHV 4 Fr	1.987	6.0
EliteHV 5 Fr	2.384	7.1
EliteHV 6 Fr	2.693	8.1
Argon 4 Fr	2.014	6.0
Argon 5 Fr	2.362	7.1
Argon 6 Fr	2.679	8.0
Avanti 4 Fr	1.963	5.9
Avanti 5 Fr	2.298	6.9
Avanti 6 Fr	2.582	7.8
PediaVasc 3.3 Fr	1.626	4.9

Conclusions

- A smaller CSI does not guarantee a smaller OD
- CSIs designed for transradial approach (Merit Prelude, Terumo Slender) had ODs that were about 1 Fr smaller than similar sized standard CSI
- The 4 Fr Merit has an OD comparable to the 3 Fr and 3.3 Fr CSIs in this study; the larger ID allows all 4 Fr compatible interventional tools while 3 Fr tools are specialty products with fewer products available and are much more costly
- Due to variation in size and impact on vascular injury, both the OD and ID should be advertised on product labels
- Clinicians should be aware of pitfalls that may occur when adopting adult-derived devices/therapies for pediatric use

References

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