GAVeCeLT 2024

An all-out comparison between mini-Midline and Midline

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Midline or Long Peripheral Catheters?

	Long Peripheral Catheter	Midline Catheter
Label	Mini-Midline, Short-Midline, Long cannulas	Midline -Midclavicular
Length	6-15 cm	>15 cm
Material	PUR – PE – PEBA	PUR - Silicon
Insertion technique	US – Direct and Simplified Seldinger technique	US – Direct and Modified Seldinger technique
Multi-lumen	No	Yes
Indications	DIVA 1– 4 weeks	DIVA > 30 days

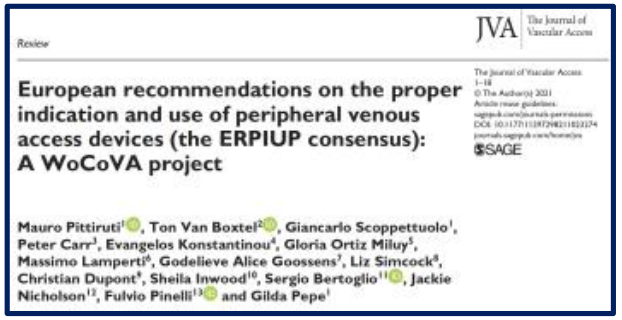

Editorial

JVA The Journal of Vascular Access

Long peripheral catheters: Is it time to address the confusion?

SAGE

Kirby R Qin[1], Ramesh M Nataraja[1,2] and Maurizio Pacilli[1,2]

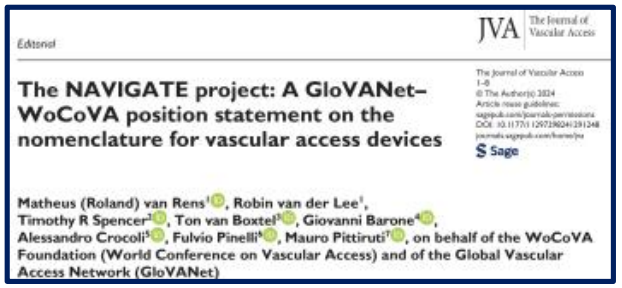

Review

JVA The Journal of Vascular Access

European recommendations on the proper indication and use of peripheral venous access devices (the ERPIUP consensus): A WoCoVA project

SAGE

Mauro Pittiruti[1], Ton Van Boxtel[2], Giancarlo Scoppettuolo[1], Peter Carr[3], Evangelos Konstantinou[4], Gloria Ortiz Miluy[5], Massimo Lamperti[6], Godelieve Alice Goossens[7], Liz Simcock[8], Christian Dupont[9], Sheila Inwood[10], Sergio Bertoglio[11], Jackie Nicholson[12], Fulvio Pinelli[13] and Gilda Pepe[1]


Editorial

JVA The Journal of Vascular Access

The NAVIGATE project: A GloVANet–WoCoVA position statement on the nomenclature for vascular access devices

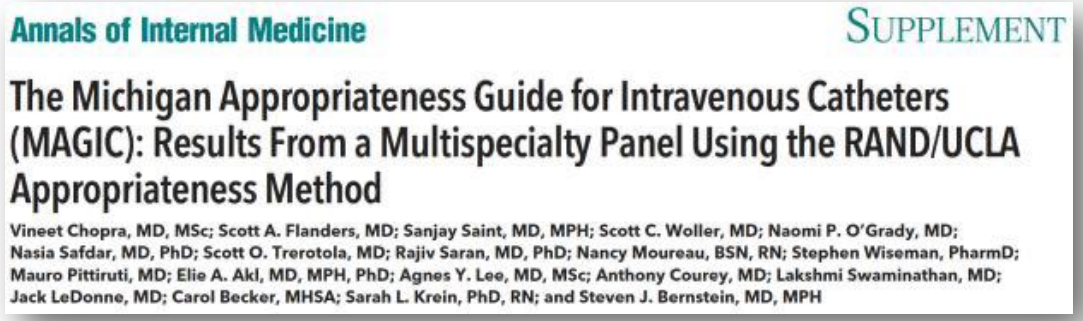
Sage

Matheus (Roland) van Rens[1], Robin van der Lee[1], Timothy R Spencer[2], Ton van Boxtel[3], Giovanni Barone[4], Alessandro Crocoli[5], Fulvio Pinelli[6], Mauro Pittiruti[7], on behalf of the WoCoVA Foundation (World Conference on Vascular Access) and of the Global Vascular Access Network (GloVANet)


SIAARTI

Buone pratiche cliniche SIAARTI

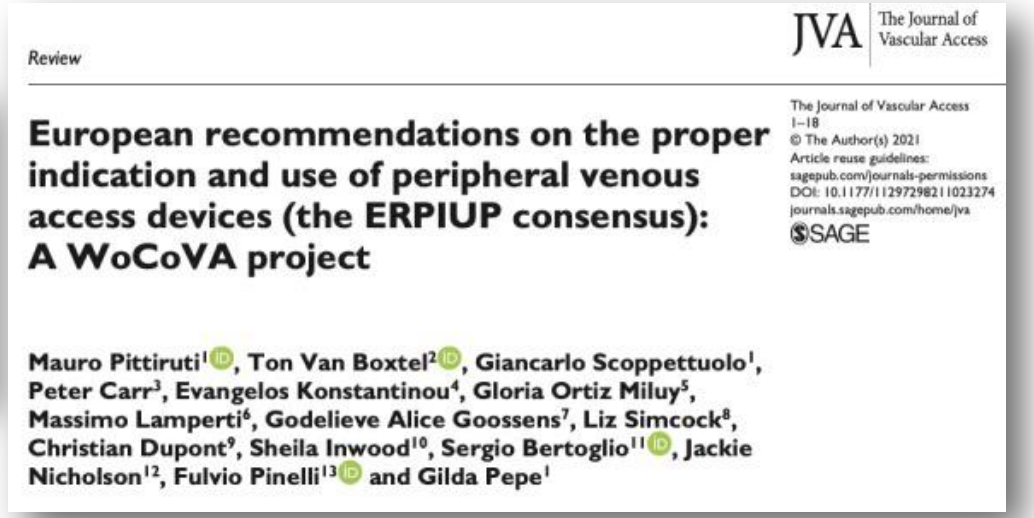
Midline or Long Peripheral Catheters?



Annals of Internal Medicine SUPPLEMENT

The Michigan Appropriateness Guide for Intravenous Catheters (MAGIC): Results From a Multispecialty Panel Using the RAND/UCLA Appropriateness Method

Vineet Chopra, MD, MSc; Scott A. Flanders, MD; Sanjay Saint, MD, MPH; Scott C. Woller, MD; Naomi P. O'Grady, MD; Nasia Safdar, MD, PhD; Scott O. Trerotola, MD; Rajiv Saran, MD, PhD; Nancy Moureau, BSN, RN; Stephen Wiseman, PharmD; Mauro Pittiruti, MD; Elie A. Akl, MD, MPH, PhD; Agnes Y. Lee, MD, MSc; Anthony Courey, MD; Lakshmi Swaminathan, MD; Jack LeDonne, MD; Carol Becker, MHSA; Sarah L. Krein, PhD, RN; and Steven J. Bernstein, MD, MPH



Review

JVA The Journal of Vascular Access

European recommendations on the proper indication and use of peripheral venous access devices (the ERPIUP consensus): A WoCoVA project

The Journal of Vascular Access
1–18

DOI: 10.1177/11297298211023274
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SAGE

Mauro Pittiruti[1], Ton Van Boxtel[2], Giancarlo Scoppettuolo[1], Peter Carr[3], Evangelos Konstantinou[4], Gloria Ortiz Miluy[5], Massimo Lamperti[6], Godelieve Alice Goossens[7], Liz Simcock[8], Christian Dupont[9], Sheila Inwood[10], Sergio Bertoglio[11], Jackie Nicholson[12], Fulvio Pinelli[13] and Gilda Pepe[1]

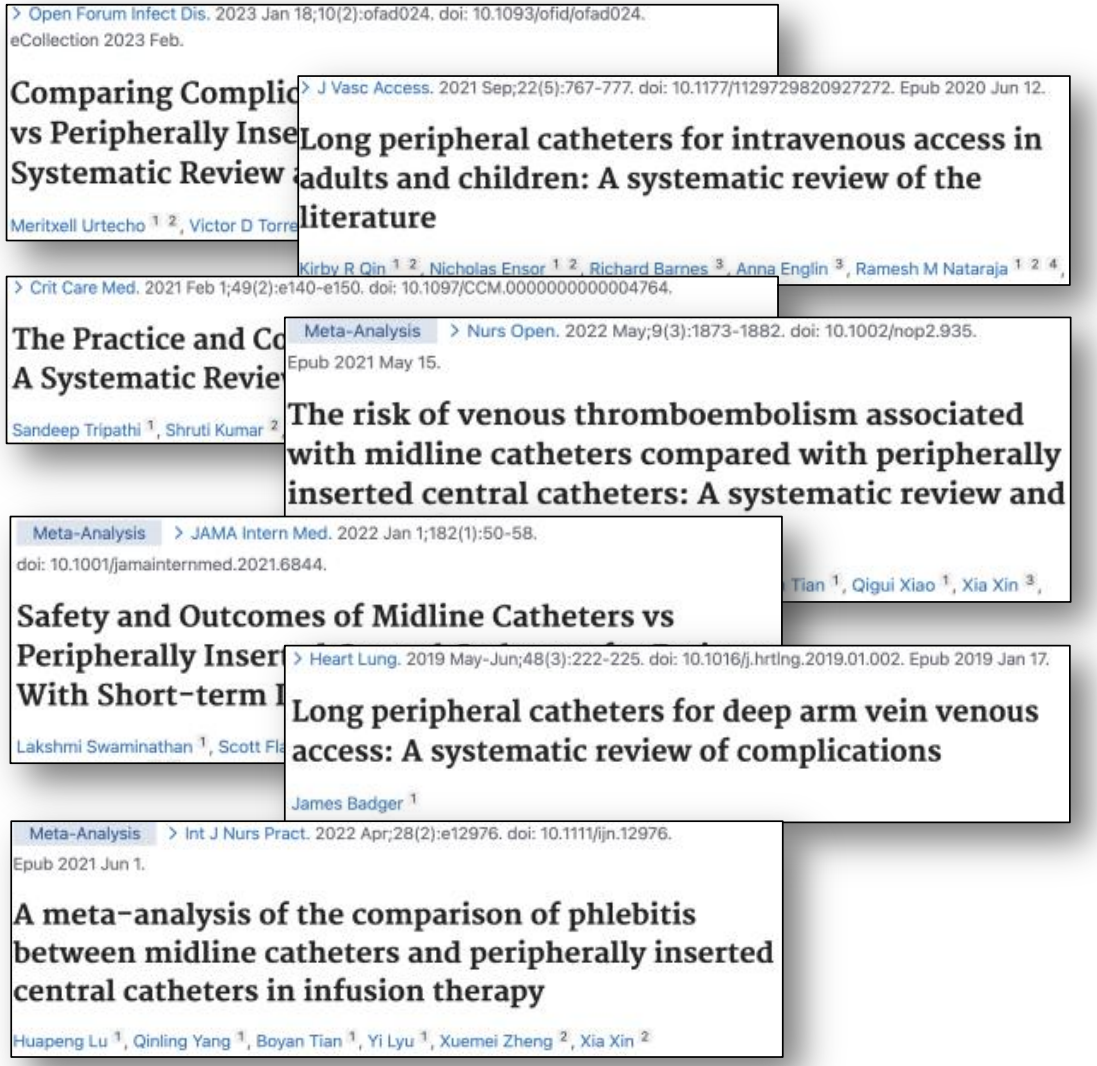
Peripheral IV Catheter = 3 – 6 cm
Midline Catheters = 7.5 – 25 cm

Short Peripheral Catheter = < 6 cm
Long Peripheral Catheter = 6 – 15 cm
Midline Catheter = > 15 cm

Midline or Long Peripheral Catheters?

Manufacturers' labels	Structural features
P ……. Midline Catheter	4 -5 Fr / 6 – 10 Cm
P ……. Midline	22 – 18 G/ 8 – 10 Cm
P ……. Midline Catheter	3 – 5 Fr/ 20 Cm
H ……. Midline	3 – 5 Fr/ 20 – 25 Cm
M …… Midline	2 – 4 Fr/ 4 – 12 Cm
A ……. Midline Catheter	4 – 5 Fr/ 20 Cm
S ……. Midline	2 – 5 Fr/ 4 – 25 Cm
L ……. Midline	3 – 4.5 Fr/ 25 Cm

Catheter Misclassification Consequences



Systematic Reviews of MCs Complications

- MCs : 20 -25 cm
- LPCs: 8 -10 cm
- Unknown structural features

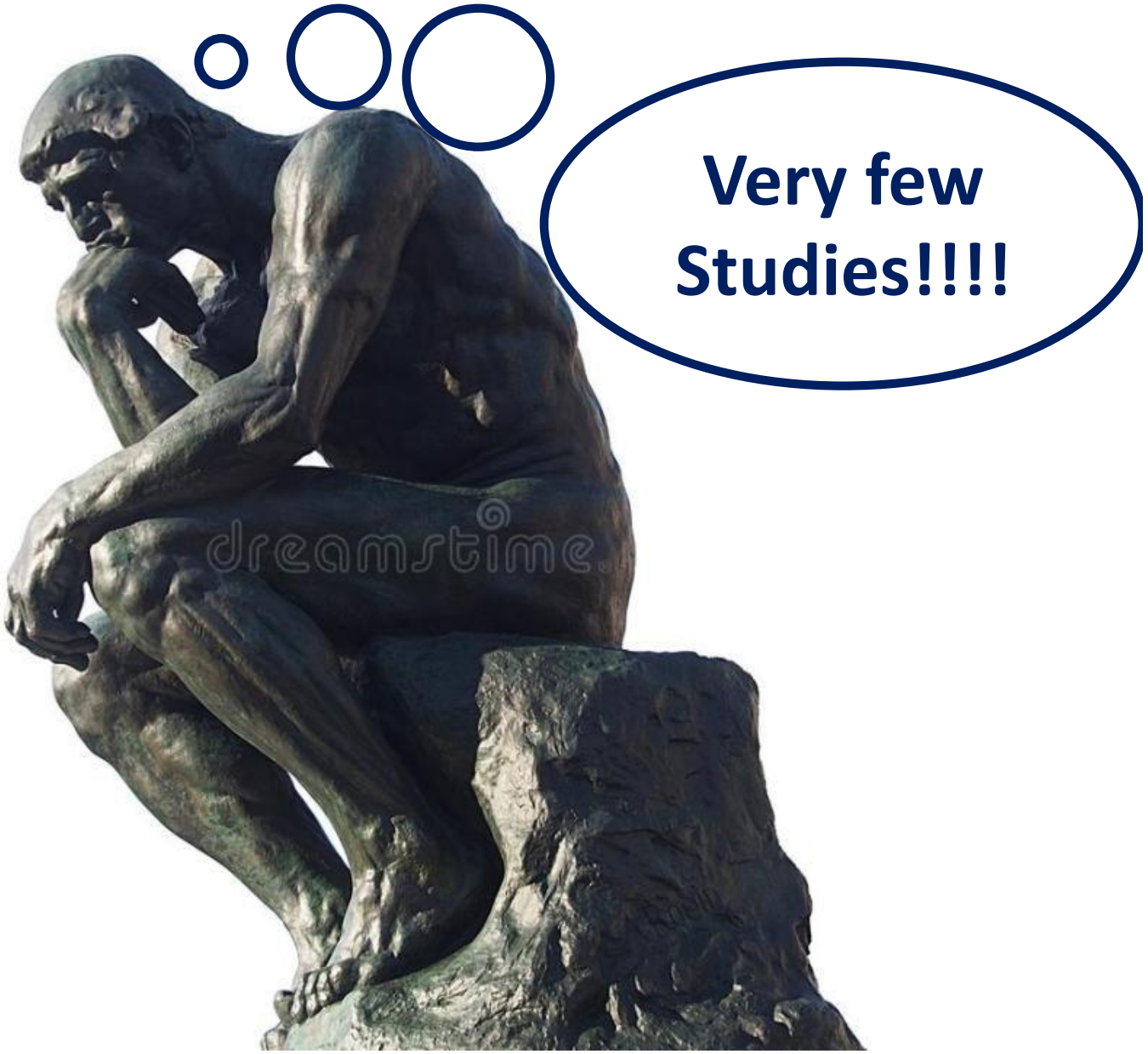
Included in review

Systematic Reviews of LPCs Complications

- MCs: 18 cm → Included in review
- LPCs misclassified in MCs → Not included in search strategy

1. **Misattribution of complications**
2. **Repercussions on clinical practice**

Is there a real difference between MCs and LPCs in terms of patient outcomes?



An attempt to bring order …

Contents lists available at ScienceDirect

Thrombosis Research

journal homepage: www.elsevier.com/locate/thromres

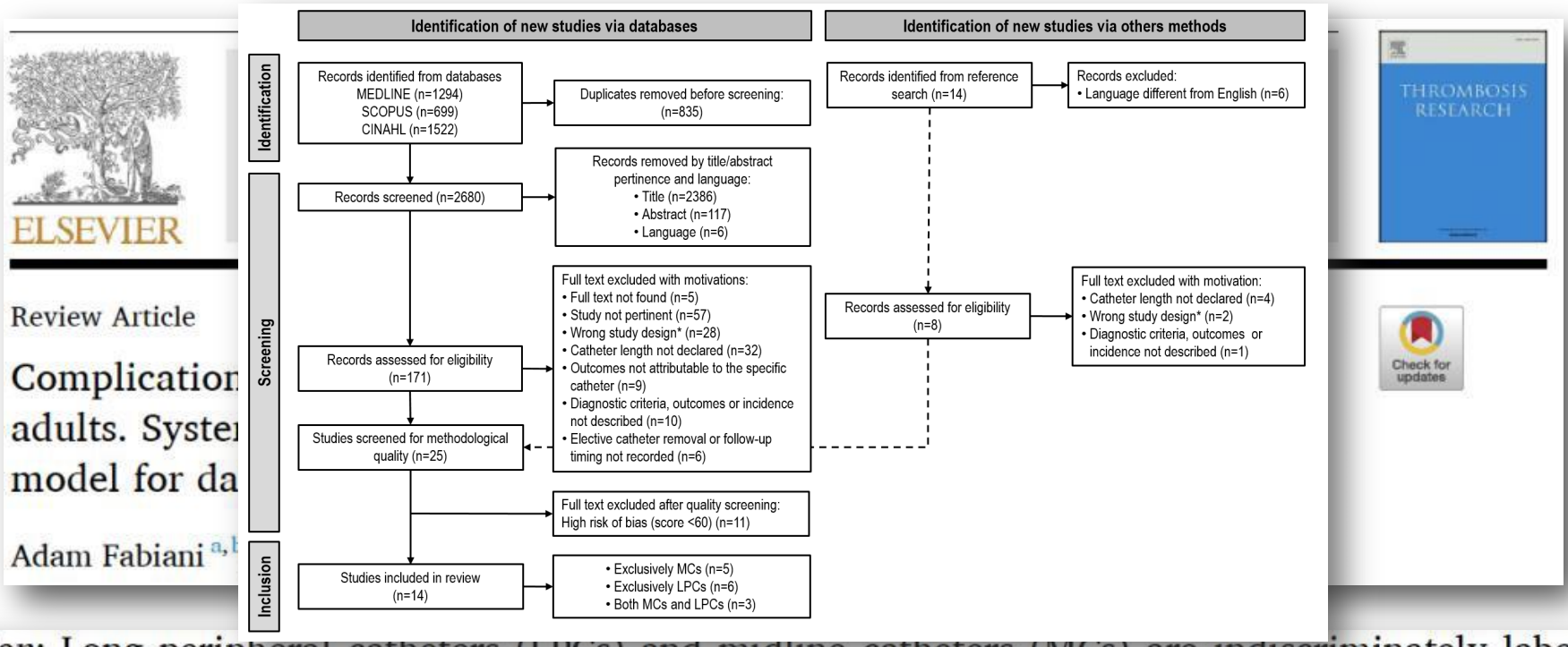
Review Article

Complications associated to midline- and long peripheral catheters in adults. Systematic review of literature and proposal for a standardized model for data collection

Adam Fabiani [a,b], Nicola Aversana [c], Marilena Santoro [b], Gianfranco Sanson [d,*]

Introduction: Long peripheral catheters (LPCs) and midline catheters (MCs) are indiscriminately labelled with different names, leading to misclassifications both in primary and secondary studies. The available studies used different methods to report the incidence of catheter-related complications, affecting the possibility of properly comparing the catheter outcomes. The aim of this review was to explore the complications related to LPCs and MCs after reclassifying according to their length.

An attempt to bring order …



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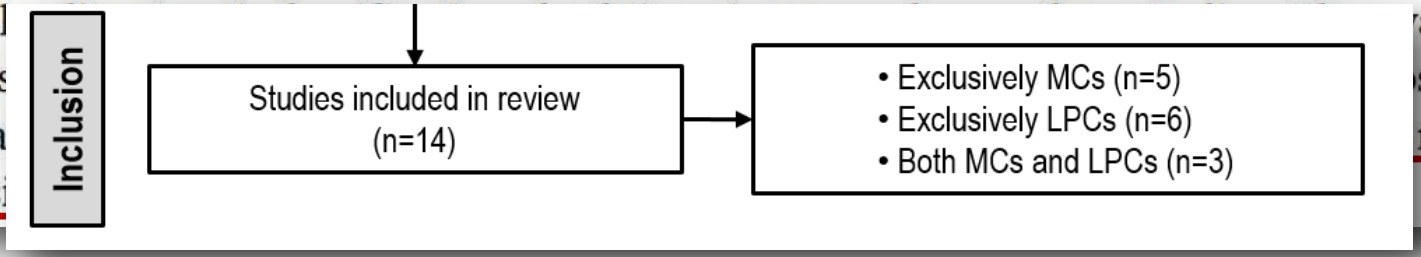

Systematic review of literature - Results

Midline-catheters: characteristics of the devices and major complications as reported by studies included in the review.

Author, Year	Catheter characteristics	Author's catheter classification	Dwelling days mean/median [max][a]	Catheter failure[b] (method)	CR-BSI[b] (method)	S-CRT[b] (method)
Bahl, 2021	4 Fr/20 cm (PUR-AT)	Midline-catheter	11.2 ± 6.6 [nd]	20.8 (PR-UM/C)	0 (NHSN)	4.7 (US+Co)
Campagna, 2018	4–5 Fr/20–25 cm (nd)	Midline-catheter	26 (NA) [273]	2.5 (R-AE)	NA	0.9 (US+Co)
Fabiani, 2020	18 G/18 cm (PET)	Long-peripheral-catheter	16 ± 10.8 [48]	10.6 (PR-C)	1.3 (DTP/TC)	1.3 (US+Co)
Fabiani, 2020	4 Fr/20 cm (PUR)	Midline-catheter	26 ± 22.6 [153]	6.3 (PR-C)	0.5 (DTP/TC)	1.9 (US+Co)
Fabiani, 2023	4 Fr/20 cm (PUR)	Midline-catheter	25.7 ± 20.4 [125]	3.4 (PR-C)	0 (DTP/TC)	0.9 (US+Co)
Frondizi, 2023	4–5 Fr/20–25 cm (PUR)	Midline-catheter	12.4 ± 11.2 [nd]	NA	3.2 (DTP)	1.1 (US)
Lisova, 2018	4 Fr/20 cm (PUR)	Midline-catheter	10 (1–112) [112]	NA	NA	3.4 (US+Co + CD)
Locatello, 2022	4–5 Fr/20–25 cm (PUR)	Midline-catheter	13.1 ± 7.7 [nd]	NA	0.3 (DTP/TC)	0.9 (US+Co)
Tomàs-Lòpez, 2022	4 Fr/30 cm (PUR)	Midclavicular-catheter	21.8 ± 24.3 [312]	6.0 (UR)	0.2 (DTP/TC)	0.4 (US+Co)

Long-peripheral-catheters: characteristics of the devices and major complications as reported by studies included in the review.

Author, Year	Catheter characteristics	Author's catheter classification	Dwelling days mean/median [max][a]	Catheter failure[b] (method)	CR-BSI[b] (method)	S-CRT[b] (method)
Bahl, 2021	4.5 Fr/15 cm (PUR-AT-AM)	Midline-catheter	10.1 ± 6.6 [NA]	22.8 (PR-UM/C)	0 (NHSN)	5.7 (US+Co)
Fabiani, 2020	20–18 G/8–10 cm (PET)	Long-peripheral-catheter	11 ± 8.9 [54]	15.9 (PR-C)	0 (DTP/TC)	1.2 (US+Co)
Fabiani, 2023	18 G/10 cm (PUR)	Long-peripheral-catheter	17.1 ± 12.3 [74]	5.1 (PR-C)	1,0 (DTP/TC)	3.1 (US+Co)
Jeon, 2022	20–18 G/8–10 cm (PUR)	Midline-catheter	16.8 ± 13.5 [76]	26 (PR-C/NC)	1,0 (BC/TC + RS)	0.5 (US)
Johnson, 2022	10 cm (PUR)	Midline-catheter	(11; 5.5–19.5) [NA]	12.8 (PR-C)	0 (BC[c] + TC/DTP+ NOI)	0.6 (US/V)
Jones, 2022	20 G/8–10 cm (PUR)	Midline-catheter	8 ± NA [38]	18.3 (PR-C)	NA	0.6 (US)
Bundgaard M, 2020	20–18 G/10 cm (PUR)	Midline-catheter	(8; *0–41*) [41]	71.8 (PR-C)	0 (BC/TC)	2.1 (US)
Marsh, 2022	20–18 G/8–10 cm (PUR)	Midline-catheter	(4.9; 3.2–8) [NA]	69.3 (APIF)	0 (NHSN)	5.3 (US)
Nielsen, 2021	20–18 G/10 cm (PUR)	Midline-catheter	(9; *0–60*) [60]	48.9 (PR)	0 (BC/TC + NOI)	0.8 (US)

Systematic review of literature - Results

Table 6
Cumulative complication rates by considering the overall data of the included studies.

Outcome	Midline-catheters				Long-peripheral-catheters			
	Catheters (n)	Events (n)	Crude rate (%)	Incidence (1000 c/d)	Catheters (n)	Events (n)	Crude rate (%)	Incidence (1000 c/d)
Major complications								
CR-BSI	3046	19	0.6	0.3	755	4	0.5	0.4
S-CRT	5023	114	2.3	0.9	962	20	2.1	1.8
Minor complications								
Exit-site infections/phlebitis	4865	18	0.4	0.1	962	49	5.1	4.4
Leaking/infiltration/extravasation	4865	29	0.6	0.2	962	28	2.9	2.5
Occlusion/malfunction	5023	172	3.4	1.3	962	28	2.9	2.5
Accidental removal/dislodgment	4865	215	4.4	1.7	962	66	6.9	5.9

CR-BSI: catheter-related blood-stream infection. S-CRT: symptomatic catheter-related thrombosis.

Other critical issues

1. Asymptomatic CRT and Fibroblastic sleeve: not reported
2. Catheter failure: high heterogeneity of causes attributed in different studies

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Adam Fabiani [a,b], Nicola Aversana [c], Marilena Santoro [b], Gianfranco Sanson [d,*]

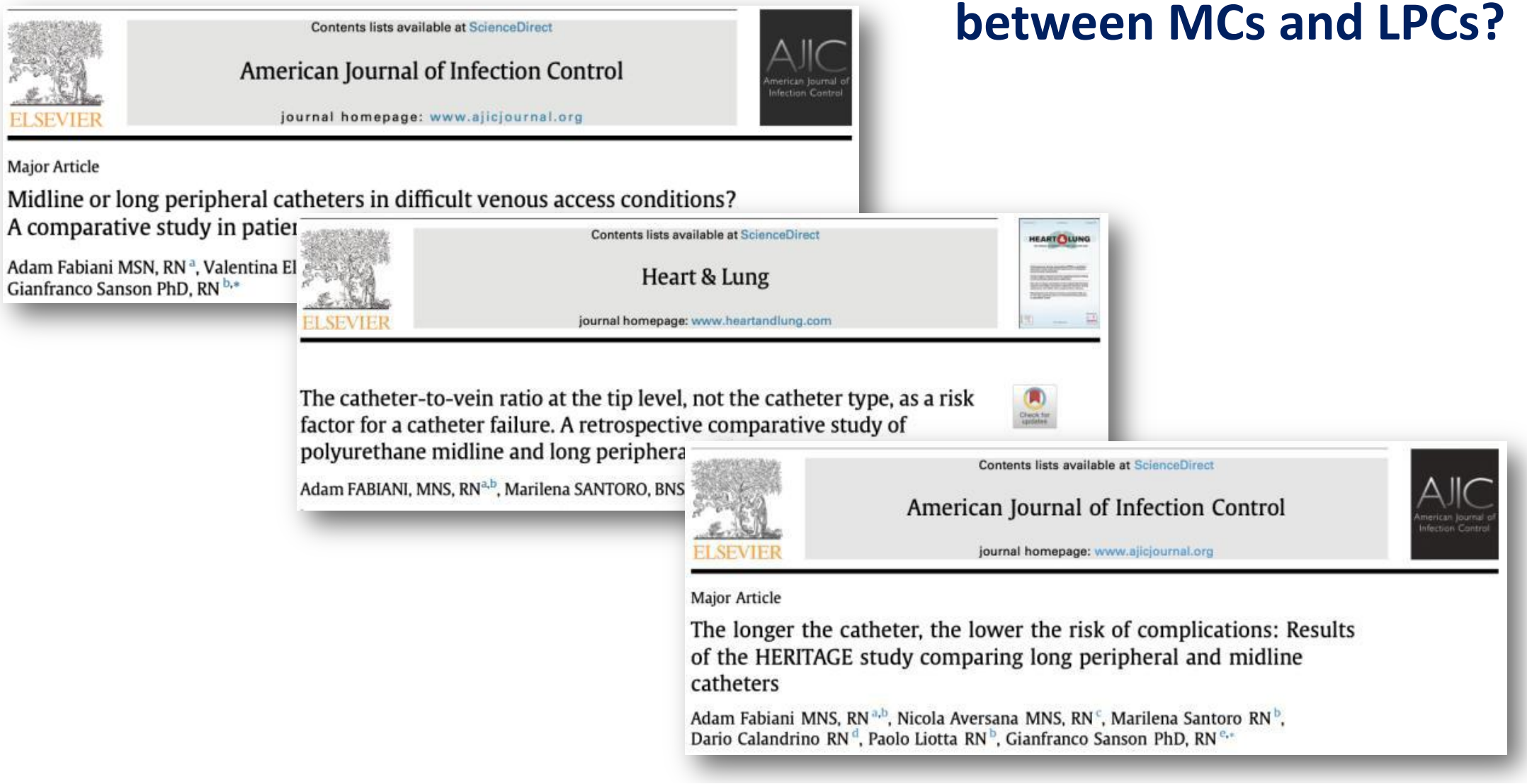
A standardized model has been proposed for clinicians and researchers on how to standardize study data to make them homogeneous and comparable:

- Vascular access nomenclature
- Structural characteristics of vascular access used
- Diagnosis criteria of outcomes
- Method of reporting outcomes

Table 7
Definitions and variables to standardize data collection for epidemiological and research purposes.

Catheter nomenclature	
Central venous catheters (CVC)	Intravenous device having its distal tip placed either at the lower third of superior (inferior for femoral devices) vena cava, or at the atrio-caval junction, or in the upper portion of the right atrium. Based on the insertion point, CVCs are classified as: - Centrally inserted CVC (CICC): CVC accessed via cervico-thoracic district veins - Femorally inserted CVC (FICC): CVC accessed via femoral veins - Peripherally inserted CVC (PICC): CVC accessed via deep veins of the arms
Peripheral venous catheters (PVC)	Intravenous device positioning in the upper limbs having its distal tip placed outside the vena cava. Based on their length, PVCs are classified as: - Short PVC (S-PVC): PVC ≤ 6 cm - Long PVC (L-PVC): PVC > 6 cm and ≤ 15 cm - Midline PVC (M-PVC): PVC > 15 cm
Identification of catheter and vein characteristics	
Catheter	Nomenclature, manufacturer, biomaterial, length, internal/external diameter
Vein	Exit site location. Name, depth, internal diameter of cannulated vein (at insertion and tip levels)
Catheter related complications (CRCs): definitions, diagnostic criteria and metric to report catheter outcomes	
Bloodstream infection	- Catheter patency for withdrawal: differential time to positivity >2 h in comparing cultures blood samples drawn from the catheter and from a peripheral vein - Impossible withdrawal: isolation of the same microorganism (species and antimicrobial susceptibility testing) from the catheter tip (>15 colony-forming units) and a peripheral blood sample
Thrombosis	US visualization of an echogenic intravascular structure involving the vein wall of a US-incompressible vein. Report if: - the thrombus is mural (i.e., not completely occupying the vein lumen) or obstructive (i.e., completely occupying the vein lumen) - the thrombosis is symptomatic (i.e., associated with at least one of the symptoms of inflammation [see Phlebitis] or leakage by the exit site, infiltration or extravasation) or asymptomatic-CRT (no associated symptoms)
Fibroblastic sleeve	Thin layer echogenic material (>1 mm) around the catheter wall, detectable along the entire catheter length, with a regular surface and little ("bridges") or no relationship with the vein wall. Report if the FS is symptomatic (associated with loss catheter usability, extravasation) or asymptomatic (no associated symptoms)
Exit site infection	Infection of the skin at the exit site is usually associated with serous or purulent exudate and signs of inflammation, consider obtaining swab of site for culture.
Phlebitis	Inflammation of the vein as detected by the presence of inflammation (tenderness, swelling, pain, erythema or palpable vein). Use Visual Infusion Phlebitis score (VIP) to monitor and classify severity. To be considered and reported only after excluding symptomatic CRT
Extravasation	Leakage of injected drugs out of the vein, with infiltration the surrounding tissues or leaking from the exit site. To be reported only after excluding symptomatic CRT or FS
Standardized CRC incidence	(total number of CRC / total catheters days) × 1000
Condition associated with loss of catheter usability[a]	
Total occlusion	Inability to infuse and aspirate
Sub-occlusion	Difficulty in infusing and aspirating
Persistent withdrawal occlusion	Possibility to infuse but not to aspirate
Dwelling time and reason for catheter removal[b]	
Catheter dwelling time	Interval (days) between the dates of placement and removal (whatever the reason). Monitoring stopped before cath. removal: report the information and the last follow-up date
Catheter success	Removal at end of use despite possible complications non precluding catheter usability
Catheter failure	Removal due to loss of catheter usability (any complication) while it was still necessary (e.g., iv therapies, frequent blood sampling), requiring a catheter replacement
Cath. unplanned removal	Removal of an uncomplicated still in-use catheter (e.g., accidental removal, patient death)

Are there any comparative studies between MCs and LPCs?



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American Journal of Infection Control

journal homepage: www.ajicjournal.org

Major Article

Midline or long peripheral catheters in difficult venous access conditions? A comparative study in patie

Adam Fabiani MSN, RN [a], Valentina El
Gianfranco Sanson PhD, RN [b,*]

Contents lists available at ScienceDirect

Heart & Lung

journal homepage: www.heartandlung.com

The catheter-to-vein ratio at the tip level, not the catheter type, as a risk factor for a catheter failure. A retrospective comparative study of polyurethane midline and long peripher

Adam FABIANI, MNS, RN[a,b], Marilena SANTORO, BNS

Contents lists available at ScienceDirect

American Journal of Infection Control

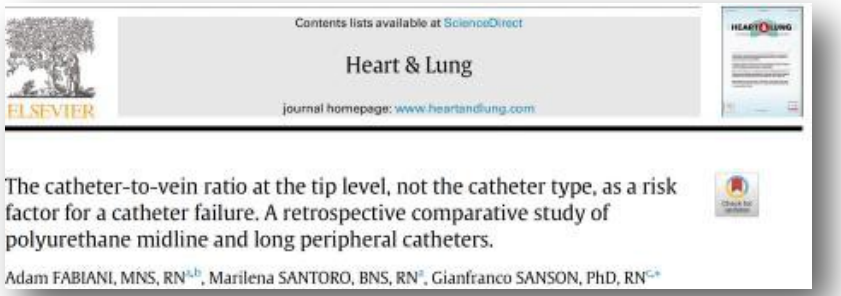
journal homepage: www.ajicjournal.org

Major Article

The longer the catheter, the lower the risk of complications: Results of the HERITAGE study comparing long peripheral and midline catheters

Adam Fabiani MNS, RN [a,b], Nicola Aversana MNS, RN [c], Marilena Santoro RN [b], Dario Calandrino RN [d], Paolo Liotta RN [b], Gianfranco Sanson PhD, RN [e,*]

Retrospective cohort study



General characteristics of the enrolled population and differences according to the implanted intravenous devices.

Variable	All catheters	LPC (n.114)	MC (n.126)	*p*-value
Patient characteristics				
Age (years)	67.7 ± 11.6	69.2 ± 10.7	66.3 ± 12.2	0.055
Sex (male)	148 (61.7%)	73 (64.0%)	75 (59.5%)	0.473
Charlson comorbidity index	5.8 ± 3.0	5.8 ± 2.8	5.8 ± 3.2	0.938
Cannulated vein				<0.001
Basilic	161 (67.1%)	69 (60.5%)	92 (73.0%)	
Brachial	58 (24.2%)	24 (21.1%)	34 (27.0%)	
Cephalic	21 (8.8%)	21 (18.4%)	0 (0.0%)	
Depth of cannulated vein (cm)	1.2 ± 0.4	1.1 ± 0.3	1.3 ± 0.4	<0.001
Measures at insertion level				
Inner caliber of the vein (mm)	4.7 ± 1.2	4.7 ± 1.2	4.8 ± 1.1	0.328
Catheter-to-vein ratio (%)	31.3 ± 8.5	32.3 ± 9.6	30.4 ± 7.2	0.092
Catheter-to-vein ratio > 45%	12 (5%)	11 (9.6%)	1 (0.8%)	0.002
Measures at tip level				
Inner caliber of the vein (mm)	6.9 ± 1.2	6.1 ± 2.1	7.6 ± 2.1	<0.001
Catheter-to-vein ratio (%)	23.0 ± 9.3	26.3 ± 11.0	20.0 ± 6.1	<0.001
Catheter-to-vein ratio > 45%	5 (2.1%)	5 (4.4%)	0 (0.0%)	0.024
Infusion of more than 2 different drugs	37 (15.4%)	8 (7.0%)	29 (23.0%)	<0.001
Total indwell time (days)	21.6 ± 17.5	17.1 ± 12.3	25.7 ± 20.4	<0.001

Data are described as mean ± standard deviation or number (percentage). LPC: long peripheral catheter. MC: midline catheter.

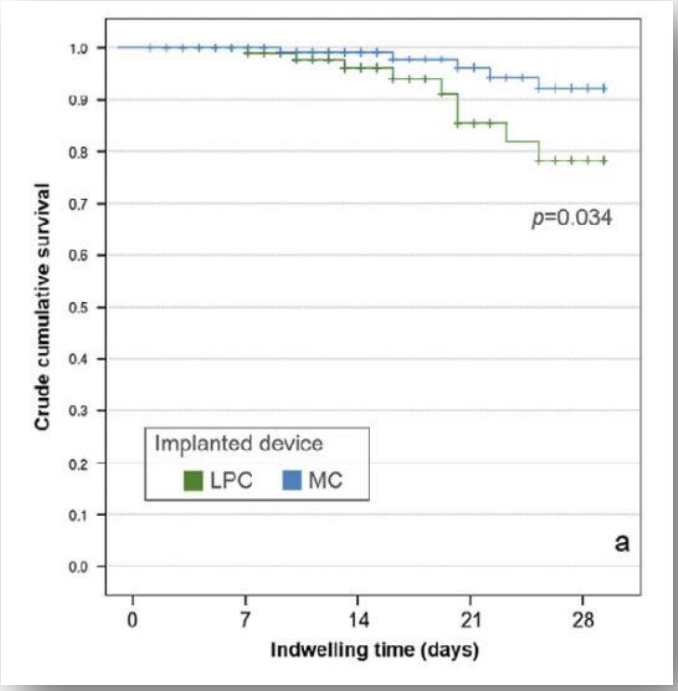
Aim: to compare the risk of catheter failure in polyurethane MCs and LPCs considering the effect of the catheter-to-vein ratio at the catheter tip level

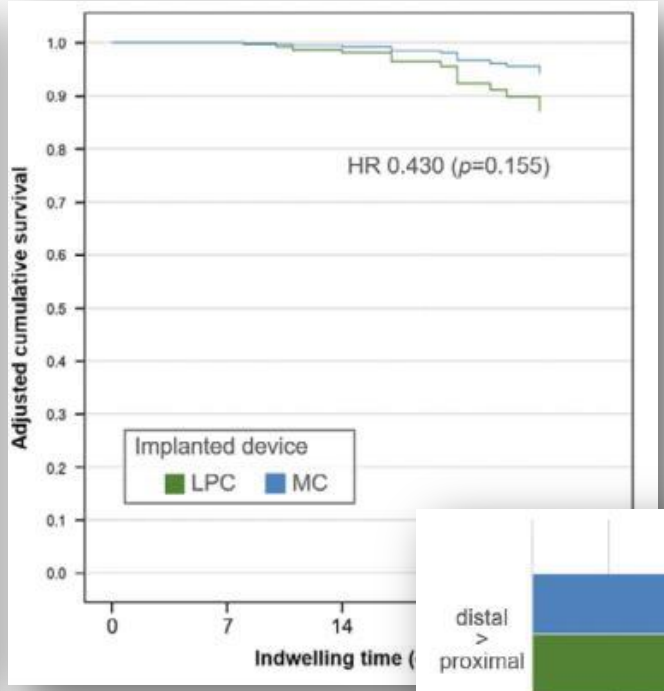
Design: retrospective observational cohort study

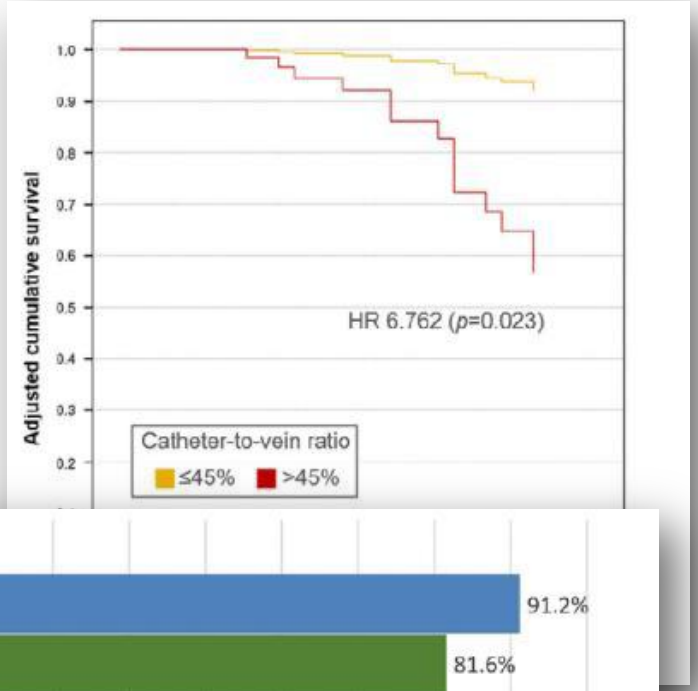
Inclusion criteria: consecutive adult cardiac surgery and cardiology patients who receive an MC or an LPC

Outcome: risk of 30 days catheter failure

Retrospective cohort study



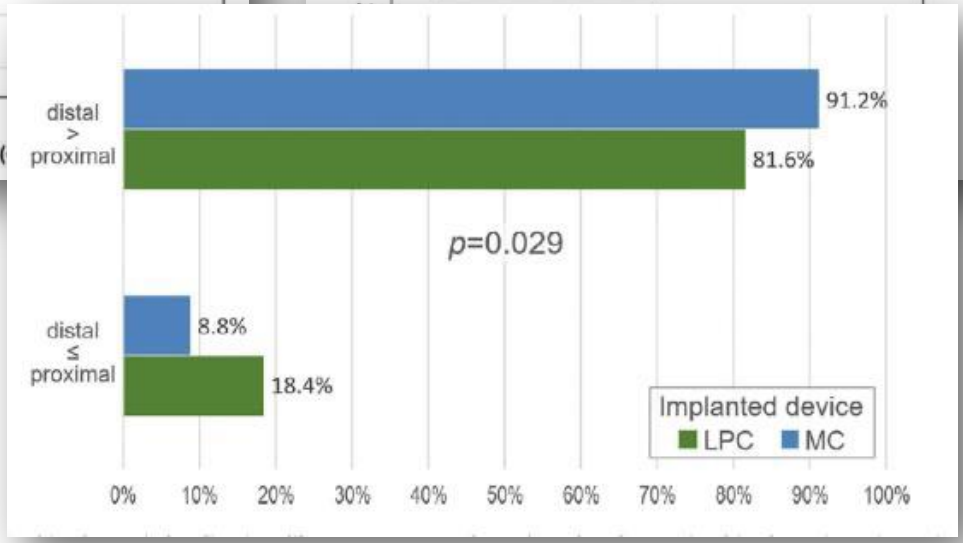




Results of Cox regression of catheter failure on study variables.

Cox proportional-hazards model	HR; 95% CI	*p*-value
Model # 5		
Device (Midline catheter)	0.430; 0.134–1.377	0.155
Catheter-to-vein ratio > 45% (tip)	6.762; 1.308–34.964	0.023
Infusion of more than two different drugs	2.763; 0.847–9.007	0.092
Patient's age	1.081; 1.004–1.164	0.040

HR: hazard ratio. CI: confidence interval.



Prospective cohort study

Table 1. General characteristics of the study population and differences according to the catheter type.

	All catheters (n. 269)	LPCs (n. 138)	MCs (n. 131)	*p*-value
Patient characteristics				
Age (years)	70.3 ± 13.3	72.3 ± 11.7	68.1 ± 14.5	0.010
Sex (male)	154 (57.2%)	73 (52.9%)	81 (61.8%)	0.139
Charlson comorbidity index	3.3 ± 2.2	3.2 ± 2.0	3.5 ± 2.4	0.309
Department				
Cardiac surgery	143 (53.2%)	66 (47.8%)	77 (58.8%)	0.003
Cardiology	51 (19.0%)	21 (15.2%)	30 (22.9%)	
Internal medicine	75 (27.9%)	51 (37.0%)	24 (18.3%)	
Cannulated vein				
Basilic	168 (62%)	75 (44.6%)	93 (55.4%)	<0.001
Brachial	69 (26%)	32 (46.4%)	37 (53.6%)	
Cephalic	32 (12%)	31 (96.9%)	1 (3.1%)	
Measures at the insertion level				
Inner caliber of the vein (mm)	4.7 ± 1.4	4.4 ± 1.4	5.0 ± 1.4	0.001
Depth of the vein (mm)	11.0 ± 4.0	10.3 ± 3.8	11.6 ± 4.1	0.005
Catheter-to-vein ratio (%)	30.9 ± 9.6	32.2 ± 10.5	29.5 ± 8.3	0.023
Catheter-to-vein ratio > 33%	81 (30.0%)	51 (37.0%)	30 (22.9%)	0.012
Catheter-to-vein ratio > 45%	14 (5.0%)	9 (6.5%)	5 (3.8%)	0.318
Measures at the tip level				
Inner caliber of the vein (mm)	7.3 ± 2.8	5.9 ± 2.6	8.8 ± 2.3	<0.001
Catheter-to-vein ratio (%)	21.8 ± 10.6	26.5 ± 12.4	16.7 ± 4.7	<0.001
Catheter-to-vein ratio > 33%	34 (13.0%)	33 (23.9%)	1 (0.8%)	<0.001
Catheter-to-vein ratio > 45%	10 (4.0%)	10 (7.2%)	0 (0.0%)	0.002
Endothelial burden of catheter use				
Vein stress index–*Any medication*	1.0 ± 0.7	0.7 ± 0.5	1.3 ± 0.8	<0.00
Vein stress index–*High risk medications*	0.2 ± 0.3	0.1 ± 0.2	0.3 ± 0.4	<0.00

LPCs: long peripheral catheters. MCs: midline catheters.

Aim: to explore the differences in terms of safety and reliability between MCs and LPCs

Design: prospective observational cohort study

Inclusion criteria: consecutive adult patients who receive an MC or an LPC for a daily clinical practice

Outcome: - incidence of catheter-related complications
- risk of catheter failure

Prospective cohort study

Contents lists available at ScienceDirect

American Journal of Infection Control

journal homepage: www.ajicjournal.org

Major Article

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Adam Fabiani MNS, RN [a,b], Nicola Aversana MNS, RN [c], Marilena Santoro RN [b], Dario Calandrino RN [d], Paolo Liotta RN [b], Gianfranco Sanson PhD, RN [e,*]

Table 2

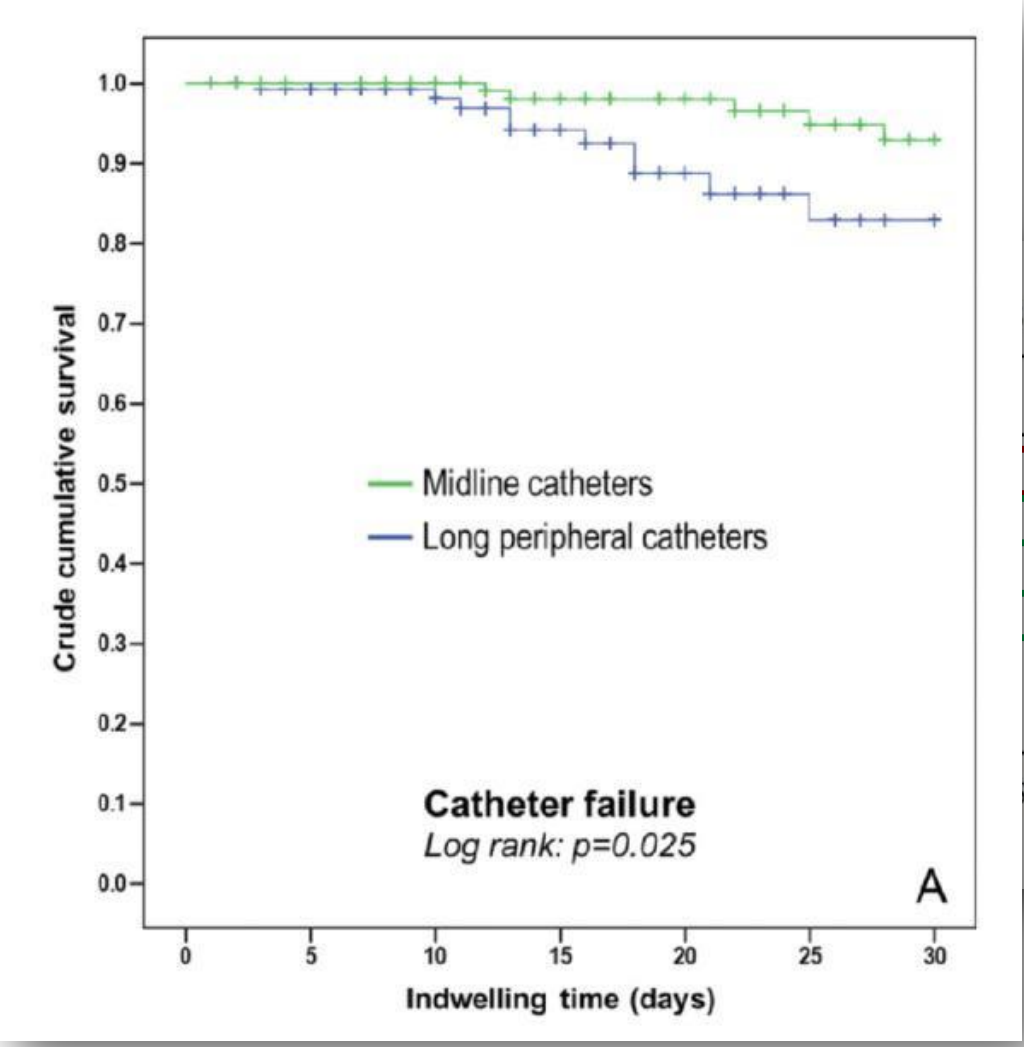
Incidence per 1,000 catheter-days of the study outcomes

	All catheters	LPCs	MCs
Catheter-failure	4.3	5.7	3.4
CR-bloodstream infections	0.4	0.9	0.0
Catheter-related thrombosis*	5.4	8.7	3.5
Symptomatic	0.4	0.5	0.3
Asymptomatic*	5.1	8.2	3.2
Fibroblastic sleeve*	10.3	14.0	8.1

CR, catheter-related; *LPCs*, long peripheral catheters; *MCs*, midline catheters.

*n. 254.

Prospective cohort study



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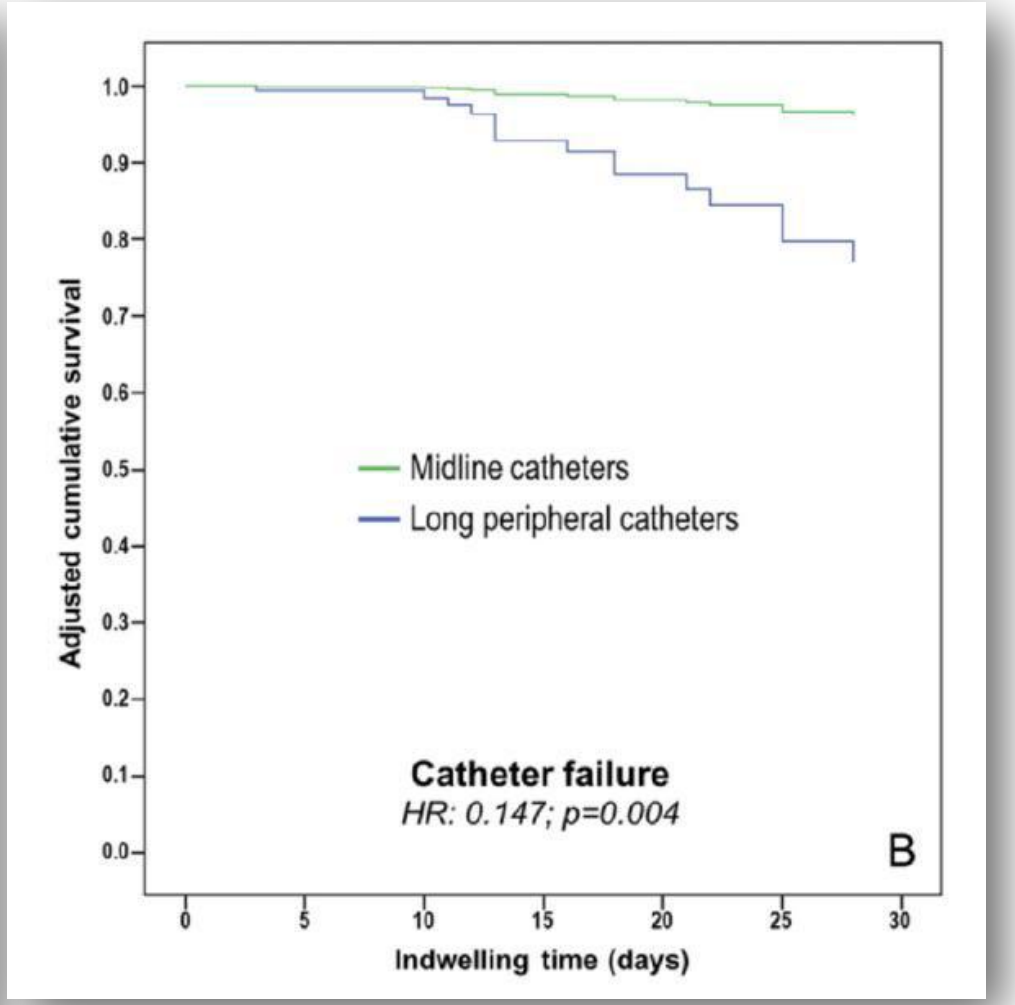
LPCs	MCs
5.7	3.4
0.9	0.0
8.7	3.5
0.5	0.3
8.2	3.2
14.0	8.1

, midline catheters.

Table 3
Variables associated with differences in catheter-failure rates

	Catheter-failure		*P* value
	No	Yes	
Patient characteristics			
Age (y)	70.2 ± 13.3	71.1 ± 13.6	.752
Sex (male)	145 (59.2%)	9 (37.5%)	.040
Charlson Comorbidity Index	3.3 ± 2.2	3.1 ± 2.4	.593
Department			
Cardiac surgery	131 (53.5%)	12 (50.0%)	.728
Cardiology	45 (18.4%)	6 (25.0%)	
Internal medicine	69 (28.2%)	6 (25.0%)	
Cannulated vein			
Basilic	156 (63.7%)	12 (50.0%)	.349
Brachial	60 (24.5%)	9 (37.5%)	
Cephalic	29 (11.8%)	3 (12.5%)	
Measures at the insertion level			
Catheter-to-vein ratio (%)	30.8 ± 9.7	31.8 ± 7.7	.620
Catheter-to-vein ratio > 33%	70 (28.6%)	11 (45.8%)	.079
Catheter-to-vein ratio > 45%	13 (5.3%)	1 (4.2%)	.810
Measures at the tip level			
Catheter-to-vein ratio (%)	21.5 ± 10.5	24.1 ± 11.7	.264
Catheter-to-vein ratio > 33%	27 (11.0%)	7 (29.2%)	.011
Catheter-to-vein ratio > 45%	8 (3.3%)	2 (8.3%)	.210
Average number of drugs infused per day			
Any medication	0.9 ± 0.7	1.3 ± 0.8	.021
High-risk medications only	0.2 ± 0.3	0.3 ± 0.4	.102



MCs = 85% less

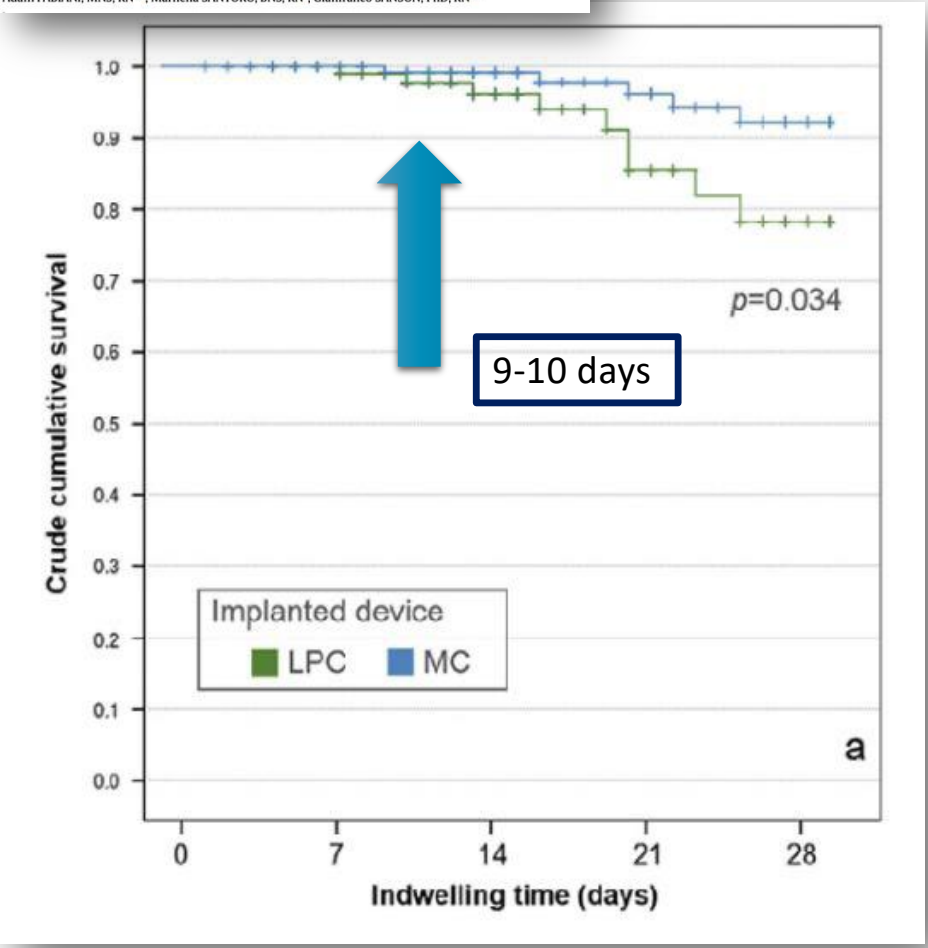
Contents lists available at ScienceDirect

Heart & Lung

journal homepage: www.heartandlung.com

The catheter-to-vein ratio at the tip level, not the catheter type, as a risk factor for a catheter failure. A retrospective comparative study of polyurethane midline and long peripheral catheters.

Adam FABIANI, MNS, RN[a,b], Marilena SANTORO, BNS, RN[a], Gianfranco SANSON, PhD, RN[c,*]



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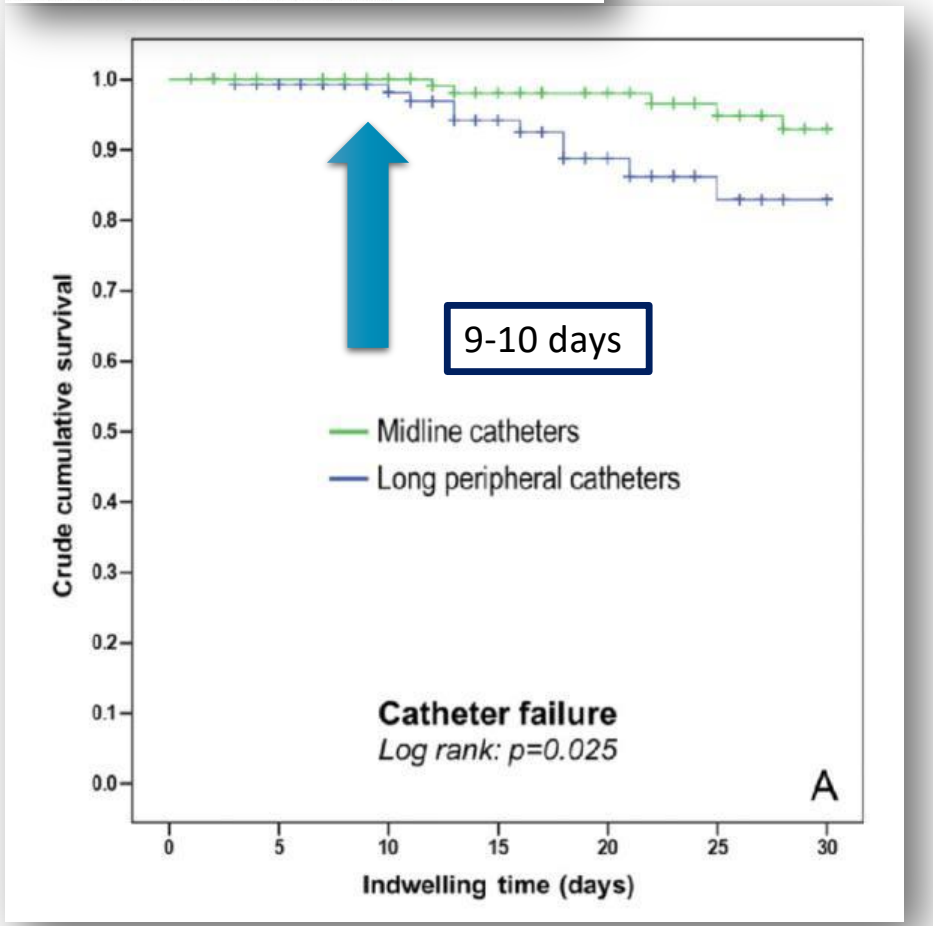

Review

JVA The Journal of Vascular Access

European recommendations on the proper indication and use of peripheral venous access devices (the ERPIUP consensus): A WoCoVA project

The Journal of Vascular Access
1–18

DOI: 10.1177/11297298211023274
journals.sagepub.com/home/jva
SAGE

Mauro Pittiruti[1], Ton Van Boxtel[2], Giancarlo Scoppettuolo[1], Peter Carr[3], Evangelos Konstantinou[4], Gloria Ortiz Miluy[5], Massimo Lamperti[6], Godelieve Alice Goossens[7], Liz Simcock[8], Christian Dupont[9], Sheila Inwood[10], Sergio Bertoglio[11], Jackie Nicholson[12], Fulvio Pinelli[13] and Gilda Pepe[1]

Editorial

JVA The Journal of Vascular Access

The NAVIGATE project: A GloVANet–WoCoVA position statement on the nomenclature for vascular access devices

The Journal of Vascular Access
1–8

DOI: 10.1177/11297298241291248
journals.sagepub.com/home/jva
Sage

Matheus (Roland) van Rens[1], Robin van der Lee[1], Timothy R Spencer[2], Ton van Boxtel[3], Giovanni Barone[4], Alessandro Crocoli[5], Fulvio Pinelli[6], Mauro Pittiruti[7], on behalf of the WoCoVA Foundation (World Conference on Vascular Access) and of the Global Vascular Access Network (GloVANet)

The indications for specific PVADs are mainly based on the expected duration of treatment:

- *SPCs are appropriate for emergency and/or short duration access (24–48 h)*
- *"integrated" SPCs are appropriate for non-emergency access, when expected duration is 2–7 days*
- *LPCs are appropriate in DIVA patients, or when expected duration is 1–4 weeks*
- *MCs are appropriate when expected duration >4 weeks.*

	LPC	MC
Design		
Length	6–15 cm	>15 cm
Technique of insertion		
Veins chosen for cannulation	Superficial and deep veins of forearm and arm	Deep veins of the arm
Technique of venipuncture	Direct venipuncture, or ultrasound guided venipuncture	Ultrasound guided venipuncture
Technique of catheter insertion	Catheter over needle, or catheter over guidewire (simple Seldinger technique)	Catheter through introducer (modified Seldinger technique)
Tunneling, if required	No	Yes
Position of the tip	Veins of the upper limb	Axillary vein (thoracic tract) or subclavian vein
Subcutaneous anchorage, if required	No	Yes
Performance		
Blood sampling	No	Yes
Expected duration	1–3 weeks	Months
Complications		
Risk of dislodgment	High	Low
Local thrombophlebitis	Frequent	Very rare
Risk of malfunction	High	Low

Prospective study

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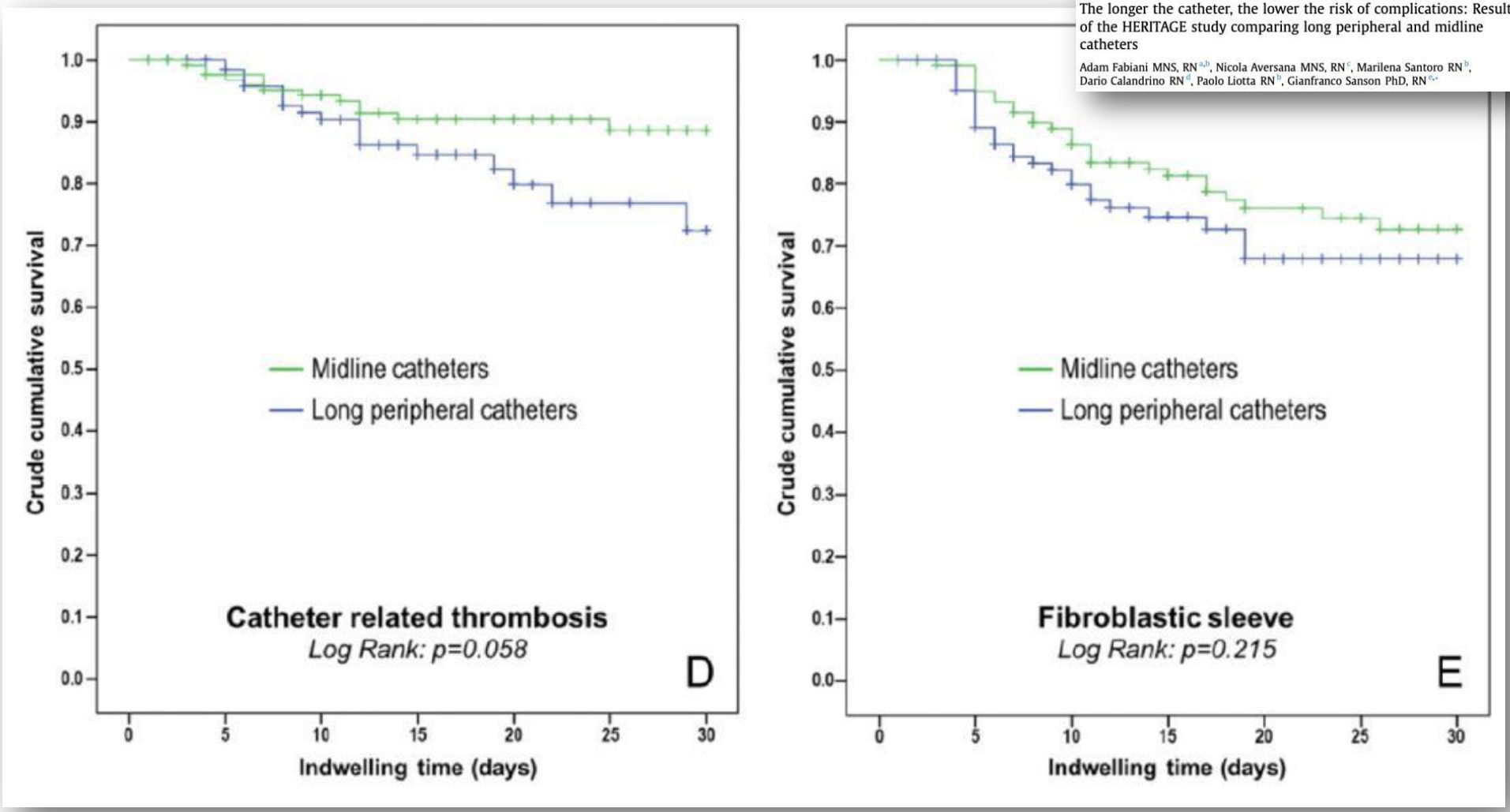
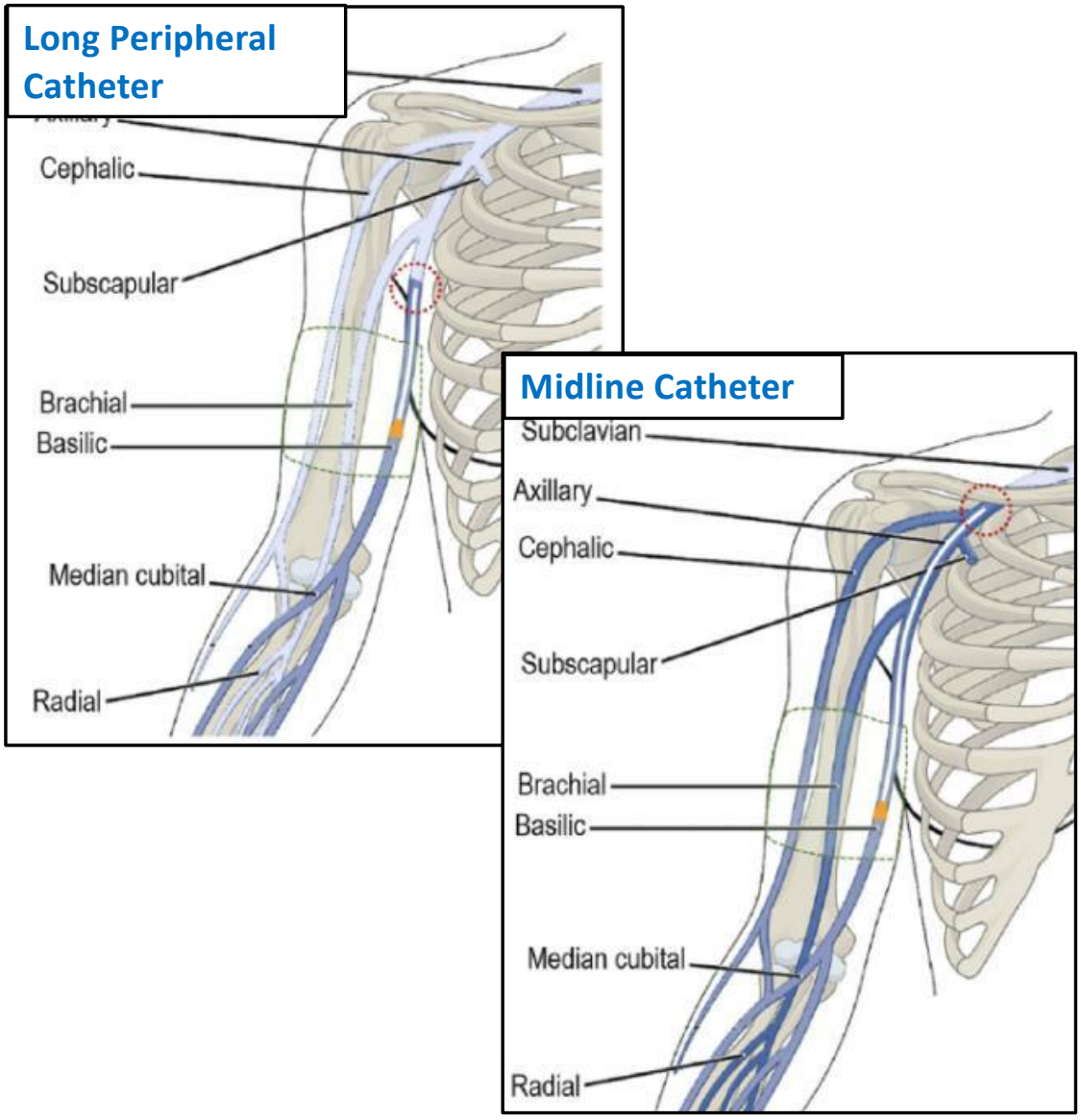


Comparative studies

- Low and similar incidences of major complications
- MCs despite a higher “venous stress index” than LPCs, have a lower risk of Catheter failure
- The catheter-to-vein ratio > 45% at the tip level is strongly associated with the risk of Catheter failure
- A lower not-significant trend of the risk of CRT in MCs than LPCs
- An equal risk of fibroblastic sleeve in both MCs and LPCs
- The risk of complications appears to be equal in the first 9 days and subsequently increases for LPCs.

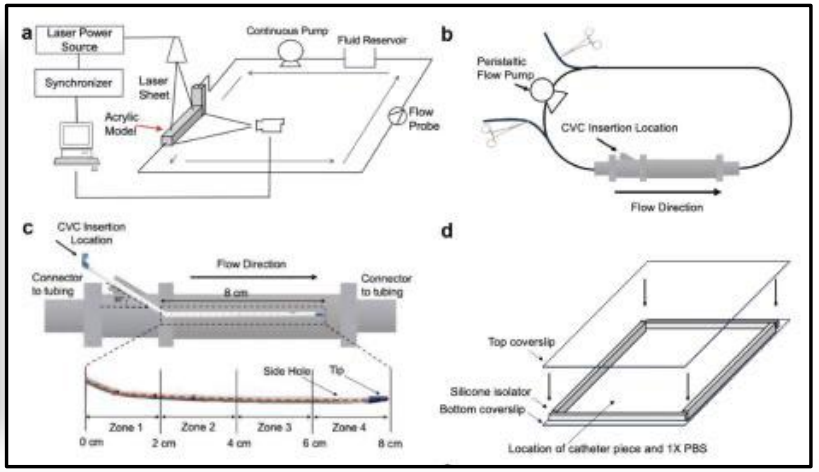


Cardiovascular Engineering and Technology
https://doi.org/10.1007/s13239-024-00761-y

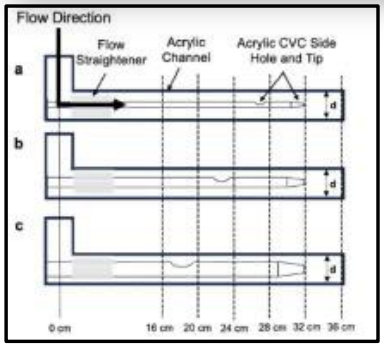
ORIGINAL ARTICLE

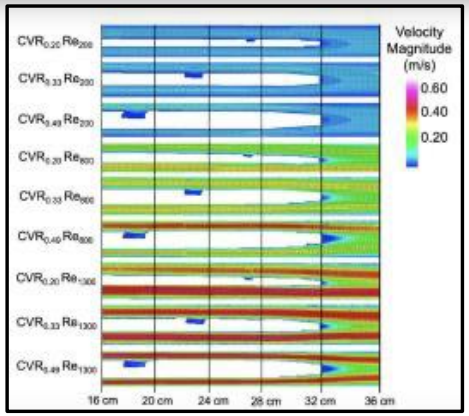
Fluid Dynamic and in Vitro Blood Study to Understand Catheter-Related Thrombosis

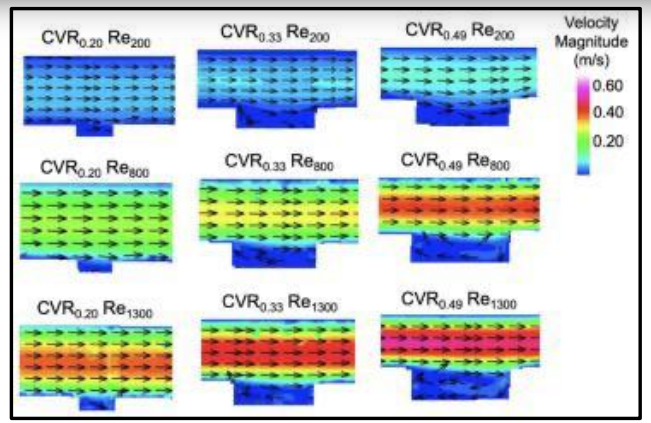
Hannah Palahnuk[1] · Boyang Su[1] · Thaddeus Harbaugh[2] · Cleo Gesenberg[3] · Shouhao Zhou[4] · Elias Rizk[2] · Jonathan Bernstein[5] · S. Will Hazard[2,6] · Keefe B. Manning[1,7]

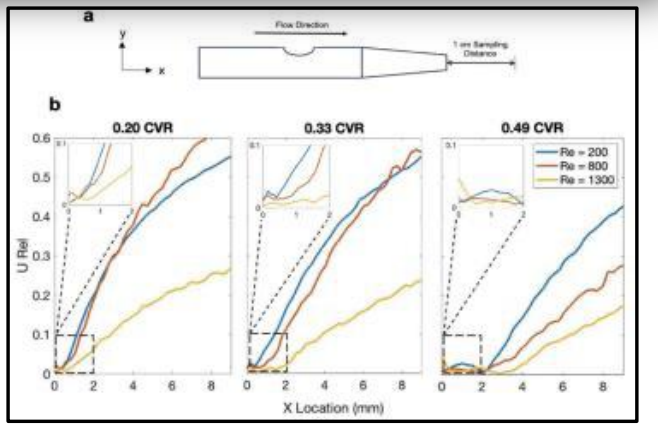


Conclusions This work demonstrates that the CVR, flow, and device geometry affect CRT. For clinical cases with CVR ≥ 0.33 and/or Re ≥ 1300, the device tip may be monitored more consistently for clot formation. Thrombosis risks remain on the entire catheter, regardless of the flow condition, for a CVR = 0.49. Device placement should be chosen carefully with respect to the combination of the Reynolds number and CVR. Further study is needed on the effect of catheterization to confirm these findings.









Take home message!!!

GAVeCeLT 2024

- There is a major gap in scientific literature regarding the vascular devices, considering a diffuse and underrated misclassification of catheters and catheter-related outcomes.
- A standardization in the classification of vascular catheters and the diagnostic criteria and methods of reporting outcomes is strategic
- MCs seem to be a more reliable solution for patients needing for more complex and longer therapeutic plans, reserving LPCs to DIVA patients with short-term needs (max 1-2 weeks?)
- Further studies are needed, to confirm and draw more definitive conclusions regarding the possible differences in safety, efficacy and reliability of MCs and LPCs.

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