



Il Convegno Nazionale PICC-port Roma - 5 Dicembre 2022

L'avvento del PICC-port: un nuovo dispositivo per i pazienti oncologici

Fabrizio Brescia

SOC Anestesia e Rianimazione – Team Accessi Vascolari

Centro di Riferimento Oncologico di Aviano

Dispositivi
totalmente
impiantati - PORT

1

SICUREZZA DEL PAZIENTE

Ridurre al minimo le complicanze

2

EFFICACIA CLINICA

Produrre l'effetto desiderato

3

EFFICIENZA AZIENDALE

Garantire un buon rapporto risultato
ottenuto/risorse impiegate

Dispositivi totalmente impiantati



Ambiente dedicato (sala procedurale)

Uso dei microintroduttori

Ecografia per venipuntura e tip navigation

Tip location con ECG IC/ecocardioscopia

Bundle di inserzione ben definito

Pochi operatori ben addestrati

Dispositivi totalmente impiantati



Fluoroscopia

Sala operatoria

Sala radiologica

Rx torace post-procedura

Dispositivi totalmente impiantati

Port toracici

Sede sopraclaveare

vena anonima
vena giugulare interna
vena succlavia

Sede sottoclaveare

vena ascellare

PICC-port

Braccio

vena basilica
vena brachiale
vena ascellare

Quale criterio per la scelta della vena?

Studio ecografico pre-procedura:

- Calibro
- Profondità
- Eventuali alterazioni patologiche
- Prevista difficoltà alla puntura

Review

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Rapid Central Vein Assessment (RaCeVA): A systematic, standardized approach for ultrasound assessment before central venous catheterization

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Timothy R Spencer¹ and Mauro Pittiruti²

Editorial

JVA | The Journal of
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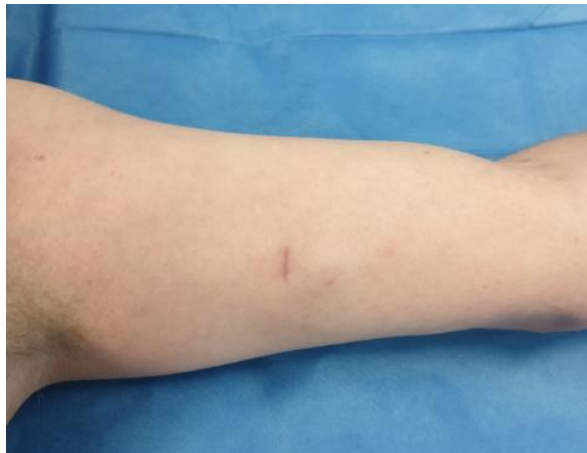
The SIP protocol update: Eight strategies, incorporating Rapid Peripheral Vein Assessment (RaPeVA), to minimize complications associated with peripherally inserted central catheter insertion

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Fabrizio Brescia¹, Mauro Pittiruti²,
Timothy R Spencer³ and Robert B Dawson⁴

Quale priorità?

- Sicurezza del paziente
- Minimo traumatismo
- Facilità della manovra
- Soddisfazione del paziente



PICC-port

Perchè?

1

Minima invasività, minimo traumatismo

2

Impianto innocuo: assenza di complicanze maggiori

3

Impianto a basso costo

4

Risolve situazioni in cui l'impianto del port toracico è difficile o controindicato

**PICC-port:
un nuovo
dispositivo**



storia...

Peripheral ports for long-term central venous access are as safe and as effective as chest ports. (Bodner, 2000)

The higher technical success rate, the lower venous thrombosis rate, (...) argue in favor of arm port placement. (Marcy, 2008)

Peripheral arm ports can be maintained with excellent short and long-term outcomes. Peripheral arm ports are considered to be a good alternative to central venous ports implanted in the chest. (Kawamura 2008)

There is a low rate of both early and late device-related complications. (Busch 2012)

storia...

Implantation of central-venous arm ports is safe and minimally invasive. No severe immediate procedural complications occur. Long term complication rates are comparable to port implantation at other sites. (Lenhart 2010)

The upper arm port had a significantly lower complication rate than the chest port. No pneumothorax risk, less risk of arterial puncture by ultrasound, feasibility of stopping potential arterial bleeding, and prevention of accidental arterial cannulation by targeting the basilic vein were the identified advantages. (Shiono 2014)

storia...

In addition to the aforementioned advantages, there is no risk of "pinch-off syndrome", possibly less patient anxiety, no scars on the neck and chest, easier accessibility, and compatibility with the "PICC technique". (Shiono 2014)

Risk of thrombosis

Higher risk (Kuriakose 2002)

Same risk (Marcy 2008, Lenhart 2010, Busch 2012, Shiono 2014)

Risk of thrombosis is minimized by simple, one-attempt, US puncture of a vein of appropriate size (Goltz 2012) and by proper central position of the tip (Ide 2012)

storia...



Nella maggior parte di questi studi sono state adottate tecniche di
impianto obsolete

- Accesso ‘blind’ alle vene del gomito
- Accesso con ‘venographic guidance’ (più invasivo e meno accurato dell’ecoguida)
- Tip location mediante fluoroscopia (più invasiva e meno accurata dell’ECG-IC)

...oggi

Il port brachiale deve oggi essere
impiantato con la stessa tecnologia
avanzata usata per i PICC !!!

1. Studio ecografico pre-procedurale
2. Venipuntura ecoguidata al braccio
3. Tecnica del microintroduttore
4. Tip navigation ecoguidata
5. Tip location mediante ECG-IC o ecocardioscopia



...oggi

Il port brachiale deve oggi essere
impiantato con la stessa tecnologia
avanzata usata per i PICC !!!

PICC-port



**PICC-port:
per i pazienti
oncologici**

**Indicazioni, corretta tecnica
di impianto e gestione** hanno
sempre un impatto sulla
funzionalità del dispositivo e
sull'incidenza delle complicanze,
anche quelle tardive

Indicazioni

Uso **prolungato** (>4-6 mesi) ma **episodico** (<1 volta a settimana) della linea infusioneale

Indicazioni 'specifiche' del PICC-port

- Prevista radioterapia del torace
- Prevista ricostruzione con lembo pettorale
- Voluminose protesi mammarie bilaterali
- Posizione supina difficile o impossibile
- Radiodermiti o altre alterazioni cutanee
- Tracheostomia complicata
- Obesità patologica
- Preferenza del paziente (considerazioni estetiche, psicologiche o sociali)
- Pazienti con prevista chemioterapia con **cetuximab** (rischio di dermatite purulenta della cute toracica)

Indicazioni

Uso **prolungato** (>4-6 mesi) ma **episodico** (<1 volta a settimana) della linea infusionale

Contrindicazioni del PICC-port

Le stesse controindicazioni dei PICC

Problemi locali di tipo: vascolare (vene troppo piccole, trombosi venose, etc.)

neuromuscolare (plegie e paresi, etc.)

osteoarticolari (amputazioni, anchilosi, fratture, etc.)

linfatiche (pregresso svuotamento linfonodi ascellari)

Insufficienza renale cronica stadio 3B – 4 – 5 (presenza di fistola AV o alta probabilità di fistola AV)

Indicazioni

Original research article

A multicenter retrospective study on 4480 implanted PICC-ports: A GAVeCeLT project

Sergio Bertoglio^{1,2}, Maria Giuseppina Annetta³, Fabrizio Brescia⁴, Alessandro Emoli⁵, Fabio Fabiani⁴, Maria Fino⁴, Domenico Merlicco⁶, Andrea Musaro⁷, Marina Orlandi⁸, Laura Parisella⁴, Fulvio Pinelli⁸, Simona Reina², Valentina Selmi⁸, Nicola Solari², Fausto Tricarico⁹ and Mauro Pittiruti¹⁰

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Original research article

PICC-PORT totally implantable vascular access device in breast cancer patients undergoing chemotherapy

Sergio Bertoglio^{1,2}, Ferdinando Cafiero², Paolo Meszaros³, Emanuela Varaldo^{1,2}, Eva Blondeaux⁴, Chiara Molinelli⁴ and Michele Minuto^{1,2}

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PICC-PORT: Valid indication to placement in patient with results of extensive skin burns of the neck and chest in oncology. The first case in the scientific literature

D. Merlicco^{a,*}, M. Lombardi^b, M.C. Fino^c

^a Vascular Access Center - General Surgery Unit, University Polyclinic Foggia-Lucera (Fg), Italy

^b Oncology Operative Unit, San Severo Hospital (Fg), Italy

^c Clinical Oncology, University Polyclinic Foggia - Lucera (Fg), Italy



A multicenter retrospective study on 4480 implanted PICC-ports: A GAVeCeLT project

Sergio Bertoglio^{1,2} , Maria Giuseppina Annetta³, Fabrizio Brescia⁴ , Alessandro Emoli⁵, Fabio Fabiani⁴, Maria Fino⁶, Domenico Merlicco⁶, Andrea Musaro⁷, Marina Orlandi⁸, Laura Parisella⁴, Fulvio Pinelli⁸ , Simona Reina², Valentina Selmi⁸, Nicola Solari², Fausto Tricarico⁹ and Mauro Pittiruti¹⁰ 

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Progetto GAVeCeLT

5 Centri italiani - 4480 PICC-ports

Insertion and maintenance of the device

PICC-ports insertion was consistently performed by properly trained clinicians (physicians or nurses), in a dedicated procedural room, adopting maximal barrier and antiseptic precautions, as required by local institutional protocols. The procedure was usually performed under local anesthesia only; intravenous sedation was added only in non-compliant or uncooperative patients.

Both the right and the left upper limb were utilized for insertion, the choice being guided by pre-procedural scan of the veins, also considering possible local contraindications (previous venous thrombosis, previous axillary dissection, abnormalities of the limb, etc.)^{7,10} and the patient's preference. Catheter insertion was performed by ultrasound-guided puncture and cannulation of deep veins (basilic, brachial, or axillary vein) at the proximal third of the upper arm (the “yellow zone,” according to Dawson's ZIM—Zone Insertion Method) (Figure 2).¹¹ The accessed vein was measured and a catheter/vein ratio ≤ 0.33 was considered appropriate.¹² Location of the catheter tip in the proximity of the cavo-atrial junction was consistently verified by intra-procedural methods (preferably by intracavitary ECG, or—as an alternative—by ultrasound-based tip location or fluoroscopy).

Table 1. Patients' characteristics and insertion procedure.

Patients' characteristics			
Number of patients	4,480		
Mean age (range)	53.9 (12–91) years		
Gender	Male	887	19.8
	Female	3593	80.2
Disease	Breast cancer	2742	61.2
	Colon cancer	694	15.5
	Head and neck cancer	220	4.9
	Lung cancer	189	4.2
	Ovarian cancer	117	2.6
	Miscellaneous cancer	391	8.7
	Non-cancer disease	127	2.8
Insertion procedure			
Mean duration (range)	28 min (15–42)		
Technical details	Local anesthesia only	4466	99.7
	Local anesthesia + sedation	14	0.3
	Tip location by intracavitary ECG	4,128	92.1
	Tip location by ultrasound or fluoroscopy	352	7.9
	Subcutaneous tunnel	2810	62.7
	No tunnel	1670	37.3

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Sergio Bertoglio^{1,2}, Maria Giuseppina Annetta³, Fabrizio Brescia⁴, Alessandro Emoli⁵, Fabio Fabiani⁴, Maria Fino⁶, Domenico Merlicco⁶, Andrea Musaro⁷, Marina Orlandi⁸, Laura Parisella⁴, Fulvio Pinelli⁸, Simona Reina², Valentina Selmi⁸, Nicola Solari², Fausto Tricarico⁹ and Mauro Pittiruti¹⁰



Table 2. Immediate/early adverse events (first 30 days after insertion).

	TAE		SAE	
	n	%	n	%
Transient ecchymosis	806	18	—	—
Symptomatic CRT	33	0.7	—	—
Local infection	24	0.5	7	0.2
CRBSI	2	0.04	1	0.02
Hematoma	9	0.2	1	0.02
Unpaired wound healing	10	0.2	1	0.02
Catheter occlusion	2	0.04	—	—
Chamber flip	4	0.09	—	—
Cardiac arrhythmia	3	0.07	—	—
Subcutaneous abnormal reaction	2	0.04	—	—
TOTAL	904	20.2	10	0.2

TAE: transient adverse event (i.e. not requiring removal); SAE: serious adverse event (i.e. requiring removal); CRT=catheter related thrombosis; CRBSI=catheter related bloodstream infection.

Table 3. Late adverse events (more than 30 days after insertion).

	TAE		SAE	
	n°	%	n°	%
Symptomatic CRT	60	1.3	1	0.02
PWO	55	0.4	—	—
Local infection	20	0.4	7	0.2
CRBSI	18	0.4	18	0.4
Skin decubitus and reservoir exposition	4	0.1	4	0.1
Catheter dislodgment with tip malposition	6	0.1	6	0.1
Catheter occlusion	4	0.1	1	0.02
Drug extravasation	5	0.1	5	0.1
Cardiac arrhythmia	4	0.1	—	—
TOTAL	176	3.9	42	0.9

TAE: transient adverse event (i.e. not requiring removal); SAE: serious adverse event (i.e. requiring removal); CRT: catheter related thrombosis; PWO: persistent withdrawal occlusion; CRBSI: catheter-related bloodstream infection.

Tecnica di impianto

Poche e chiare raccomandazioni
basate su evidenze scientifiche
capaci di agire sinergicamente
per fornire massima sicurezza,
efficacia ed economicità di una
determinata procedura

Protocollo ISP-port

1. Esplorazione ecografica sistematica di tutte le vene del braccio (dal gomito all'ascella) e delle vene maggiori della zona sottoclaveare e sopraclaveare, seguendo i protocolli RaPeVA (*Rapid Peripheral Vein Assessment*) e RaCeVA (*Rapid Central Vein Assessment*).
2. Igiene delle mani, disinfezione cutanea con clorexidina 2% in soluzione alcolica e utilizzo delle massime protezioni di barriera (mascherina e berretto non sterili, guanti sterili, camice sterile, ampio campo sterile sul paziente e coprisonda lungo per la sonda ecografica).
3. Scelta della vena più appropriata in termini di profondità e di calibro, a seconda del calibro del catetere pianificato (rapporto 1:3 tra diametro esterno del catetere e diametro interno della vena), utilizzando il sistema ZIM: l'area dove preferibilmente alloggiare il *reservoir* è la metà superiore della zona verde di Dawson; pertanto, se il sito di venipuntura ideale è situato nella zona gialla di Dawson, è bene tunnellizzare il catetere in modo da ottenere l'alloggiamento del *reservoir* nella zona verde.
4. Chiara identificazione ecografica della arteria brachiale e del nervo mediano prima di procedere alla venipuntura (e quindi utilizzo quindi di ecografi che permettano la chiara identificazione del nervo).
5. Venipuntura ecoguidata *out-of-plane* in asse corto utilizzando appropriati kit di microintroduzione (ago 21G ecogenico, microguida in nitinol *soft straight tip*, microintroduttore- dilatatore di buona qualità).
6. Controllo della posizione centrale della punta (*tip location*) mediante il metodo dell'ECG intracavitario - nella variante modificata nel caso di pazienti in fibrillazione atriale - eventualmente corroborato da *tip location* mediante ecocardiografia transtoracica con *bubble test* (secondo il protocollo ECHOTIP).
7. Nei casi in cui vi siano ostacoli alla progressione o quando non si apprezzino modifiche dell'onda P all'ECG intracavitario, controllo e direzionamento del catetere (*tip navigation*) mediante ecografia della regione sopraclaveare (visualizzazione del catetere nella vena succlavia e nella vena anonima) (secondo il protocollo ECHOTIP).
8. Creazione della tasca sopra il muscolo bicipite mediante idro-dissezione con anestesia locale, con un volume pari a quello del *reservoir*. Chiusura del derma mediante sutura intradermica a punti invertenti e apposizione di colla in cianoacrilato sulla cute. Copertura per almeno 3 giorni con medicazione trasparente semipermeabile con buona traspirabilità (alto MVTR – *moisture vapor transfer rate*).

Tecnica di impianto

Protocollo ISP-port

Original research article

A multicenter retrospective study on 4480 implanted PICC-ports: A GAVeCeLT project

Sergio Bertoglio^{1,2}, Maria Giuseppina Annetta³, Fabrizio Brescia⁴, Alessandro Emoli⁵, Fabio Fabiani⁴, Maria Fino⁶, Domenico Merlicco⁶, Andrea Musaro⁷, Marina Orlandi⁸, Laura Parisella⁴, Fulvio Pinelli⁸, Simona Reina², Valentina Selmi⁸, Nicola Solari², Fausto Tricarico⁹ and Mauro Pittiruti¹⁰

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1. Esplorazione ecografica sistematica di tutte le vene del braccio (dal gomito all'ascella) e delle vene maggiori della zona sottoclaveare e sopraclaveare, seguendo i protocolli RaPeVA (*Rapid Peripheral Vein Assessment*) e RaCeVA (*Rapid Central Vein Assessment*).
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Gestione

Percorsi formativi adeguati

42. VASCULAR ACCESS DEVICE ASSESSMENT, CARE, AND DRESSING CHANGES

Standard

42.1 The entire infusion system, from the VAD insertion site to the solution container, is routinely assessed for system integrity, infusion accuracy, identification of complications, and expiration dates of the infusate, dressing, and administration set.

42.2 The necessity of the VAD is routinely assessed and is removed upon unresolved complication and when no longer necessary for treatment.

42.3 Site care, including skin antiseptics and dressing changes, is performed at established intervals and immediately if the dressing integrity becomes compromised (eg, lifted/detached on any border edge or within transparent portion of dressing; visibly soiled; presence of moisture, drainage, or blood) or compromised skin integrity is present under the dressing.

42.4 A sterile dressing, combined or integrated with a securement device appropriate for patient's condition and patient preference, is maintained on all peripheral and central VADs to protect the site, provide a microbial barrier, and promote skin health and VAD securement.

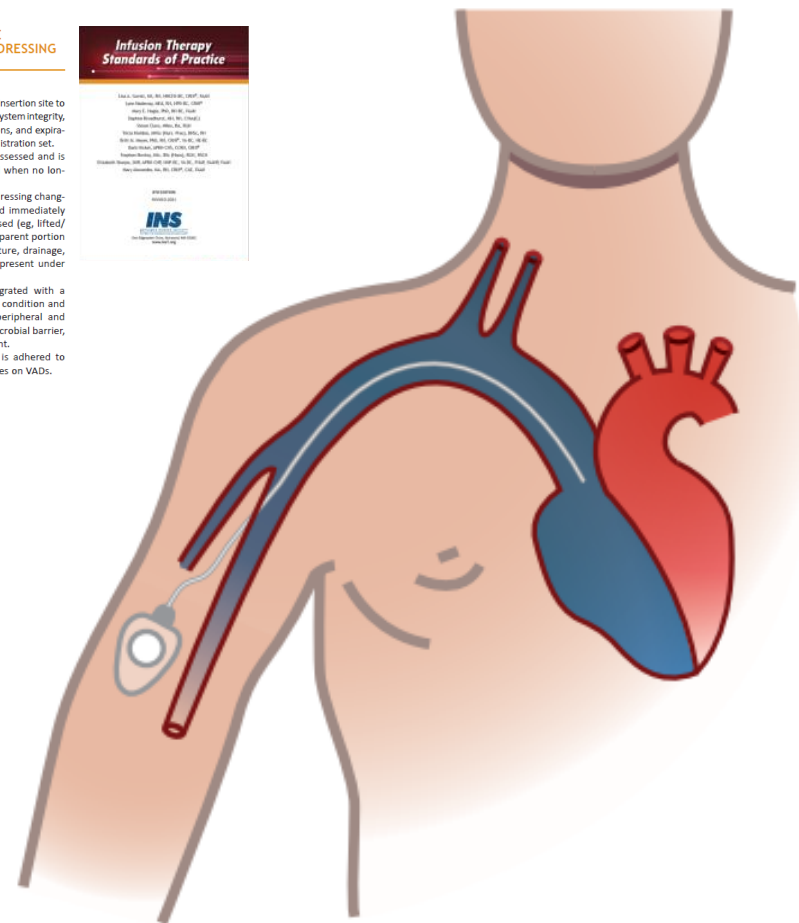
42.5 Aseptic Non Touch Technique (ANTT) is adhered to when providing site care and dressing changes on VADs.



Table 3. Late adverse events (more than 30 days after insertion).

	TAE		SAE	
	n°	%	n°	%
Symptomatic CRT	60	1.3	1	0.02
PWO	55	0.4	—	—
Local infection	20	0.4	7	0.2
CRBSI	18	0.4	18	0.4
Skin decubitus and reservoir exposition	4	0.1	4	0.1
Catheter dislodgment with tip malposition	6	0.1	6	0.1
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"The potential for the Olympic Games to promote population health has not been realised."



Central venous access devices for the delivery of systemic anticancer therapy (CAVA): a randomised controlled trial

Jonathan G Moss*, Olivia Wu*, Andrew R Bodenham, Roshan Agarwal, Tobias F Menne, Brian L Jones, Robert Heggie, Steve Hill, Judith Dixon-Hughes, Eileen Soulis, Evi Germeri, Susan Dillon, Elaine McCartney, on behalf of the CAVA trial group†

Summary

Background Hickman-type tunnelled catheters (Hickman), peripherally inserted central catheters (PICCs), and totally implanted ports (PORTs) are used to deliver systemic anticancer treatment (SACT) via a central vein. We aimed to compare complication rates and costs of the three devices to establish acceptability, clinical effectiveness, and cost-effectiveness of the devices for patients receiving SACT.

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- Hickman tunnelled catheters
- PICCs
- PORTs

18 UK oncology units

Outcomes Primary outcome
Overall complication rate
(infection or mechanical failure)

	PICCs vs Hickman		PORTs vs Hickman		PORTs vs PICCs	
	PICCs (n=190)	Hickman (n=207)	PORTs (n=243)	Hickman (n=280)	PORTs (n=137)	PICCs (n=171)
Primary operator						
Nurse	128 (67%)	47 (23%)	59 (24%)	97 (35%)	3 (2%)	125 (73%)
Radiographer	10 (5%)	15 (7%)	5 (2%)	10 (4%)	3 (2%)	7 (4%)
Anaesthesiologist	7 (4%)	42 (20%)	27 (11%)	36 (13%)	14 (10%)	5 (3%)
Radiologist	24 (13%)	96 (46%)	144 (59%)	133 (48%)	107 (78%)	18 (11%)
Doctor	1 (<1%)	4 (2%)	7 (3%)	4 (1%)	5 (4%)	1 (1%)
Surgeon	3 (2%)	1 (<1%)	0	0	5 (4%)	0
Other	16 (8%)	1 (<1%)	0	0	0	13 (8%)
Missing	1 (<1%)	1 (<1%)	1 (<1%)	0	0	2 (1%)
Setting						
Theatre	11 (6%)	61 (30%)	57 (24%)	50 (18%)	28 (20%)	5 (3%)
Procedure or treatment room	103 (54%)	39 (19%)	9 (4%)	86 (31%)	1 (1%)	61 (36%)
Radiology department	50 (26%)	103 (50%)	171 (70%)	140 (50%)	106 (77%)	42 (25%)
Bedside	12 (6%)	0	0	0	0	44 (26%)
Other	14 (7%)	4 (2%)	5 (2%)	4 (1%)	2 (2%)	17 (10%)
Missing	0	0	1 (<1%)	0	0	2 (1%)
Type of anaesthesia						
Local only	188 (99%)	180 (87%)	216 (89%)	268 (96%)	115 (84%)	168 (98%)
Local and conscious sedation	1 (<1%)	26 (13%)	27 (11%)	12 (4%)	17 (12%)	1 (1%)
General anaesthesia	0	0	0	0	5 (4%)	0
Missing	1 (<1%)	1 (<1%)	0	0	0	2 (1%)
Prophylactic antibiotics given						
Yes	3 (2%)	4 (2%)	34 (14%)	2 (1%)	24 (18%)	3 (2%)
No	179 (94%)	199 (96%)	200 (82%)	272 (97%)	109 (80%)	160 (94%)
Missing	8 (4%)	4 (2%)	9 (4%)	6 (2%)	4 (3%)	8 (5%)
Type of dressing applied						
Non-antimicrobial	159 (84%)	144 (70%)	226 (93%)	221 (79%)	121 (88%)	140 (82%)
Antimicrobial	29 (15%)	60 (29%)	10 (4%)	58 (21%)	12 (9%)	25 (15%)
Missing	2 (1%)	3 (1%)	7 (3%)	1 (<1%)	4 (3%)	6 (4%)

Data are n (%). Table excludes patients with no device fitted and patients in whom technical insertion failure prevented a device from being fitted. PICCs=peripherally inserted central catheters. Hickman=Hickman-type tunnelled catheters. PORTs=totally implanted ports. Other primary operators include (but are not limited to) advanced practitioners, specialist nurses, and senior operating department practitioners.

Table 1: Procedure details for all comparisons

"The potential for the Olympic Games to promote population health has not been realised."

Intervall	Aktuelle	Intervall	Intervall	Intervall
1. Intervall: 1. bis 10. April 2014	2. Intervall: 11. bis 20. April 2014	3. Intervall: 21. bis 30. April 2014	4. Intervall: 1. bis 10. Mai 2014	5. Intervall: 11. bis 20. Mai 2014
1. Intervall: 1. bis 10. April 2014	2. Intervall: 11. bis 20. April 2014	3. Intervall: 21. bis 30. April 2014	4. Intervall: 1. bis 10. Mai 2014	5. Intervall: 11. bis 20. Mai 2014

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Summary

Background Hickman-type tunnelled catheters (Hickman), peripherally inserted central catheters (PICCs), and totally implanted ports (PORTs) are used to deliver systemic anticancer treatment (SACT) via a central vein. We aimed to compare complication rates and costs of the three devices to establish acceptability, clinical effectiveness, and cost-effectiveness of the devices for patients receiving SACT.

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Type of cancer

Metastatic Disease

	PICCs vs Hickman		PORTs vs Hickman		PORTs vs PICCs	
	PICCs (n=212)	Hickman (n=212)	PORTs (n=253)	Hickman (n=303)	PORTs (n=147)	PICCs (n=199)
Age, years						
Mean (SD)	62 (11)	61 (12)	59 (13)	60 (13)	61 (12)	61 (13)
Range	19-85	20-87	19-86	20-87	28-86	19-84
Gender						
Women	102 (48%)	96 (45%)	112 (44%)	151 (50%)	81 (55%)	107 (54%)
Men	110 (52%)	116 (55%)	141 (56%)	152 (50%)	66 (45%)	92 (46%)
Body-mass index, mg/kg**						
<20	10 (5%)	12 (6%)	13 (5%)	16 (5%)	9 (6%)	8 (4%)
20 to <30	145 (68%)	145 (68%)	171 (68%)	209 (69%)	98 (67%)	139 (70%)
30 to <40	51 (24%)	49 (23%)	61 (24%)	70 (23%)	36 (25%)	47 (24%)
≥40	6 (3%)	6 (3%)	8 (3%)	8 (3%)	4 (3%)	5 (3%)
Ethnicity						
White	204 (96%)	210 (99%)	246 (97%)	293 (97%)	137 (93%)	182 (92%)
Asian	3 (1%)	1 (<1%)	4 (2%)	1 (<1%)	3 (2%)	5 (3%)
Southeast Asian	0	0	1 (<1%)	0	3 (2%)	0
Afro-Caribbean	1 (<1%)	1 (<1%)	2 (1%)	3 (1%)	3 (2%)	6 (3%)
Other	0	0	0	1 (<1%)	1 (1%)	4 (2%)
Missing	4 (2%)	0	0	5 (2%)	0	2 (1%)
Type of cancer†						
Solid tumour	185 (87%)	184 (87%)	235 (93%)	280 (92%)	142 (97%)	190 (96%)
Colorectal	104 (56%)	120 (65%)	138 (59%)	168 (60%)	65 (46%)	89 (47%)
Breast	21 (11%)	21 (11%)	27 (12%)	42 (15%)	22 (16%)	27 (14%)
Pancreas	27 (15%)	15 (8%)	16 (7%)	18 (6%)	12 (9%)	25 (13%)
Other	31 (17%)	28 (15%)	54 (23%)	48 (17%)	43 (30%)	48 (25%)
Missing	2 (1%)	0	0	4 (1%)	0	1 (<1%)
Haematological malignancy	27 (13%)	28 (13%)	18 (7%)	23 (8%)	5 (3%)	9 (5%)
Acute myeloid leukaemia	7 (26%)	11 (39%)	5 (28%)	13 (57%)	2 (40%)	1 (11%)
High-grade non-Hodgkin lymphoma	5 (19%)	8 (29%)	4 (22%)	3 (13%)	0	4 (44%)
Hodgkin disease	4 (15%)	3 (11%)	4 (22%)	3 (13%)	0	1 (11%)
Other	10 (37%)	6 (21%)	5 (28%)	3 (13%)	3 (60%)	2 (22%)
Missing	1 (4%)	0	0	1 (4%)	0	1 (11%)
Metastatic disease (patients with solid tumours only)						
Yes	114 (62%)	108 (59%)	156 (66%)	191 (68%)	93 (66%)	123 (65%)
No	68 (37%)	76 (41%)	79 (34%)	85 (30%)	48 (34%)	65 (34%)
Missing	3 (2%)	0	0	4 (1%)	1 (1%)	2 (1%)
Patients being administered fluorouracil	137 (65%)	143 (68%)	179 (71%)	198 (65%)	91 (62%)	122 (61%)
Planned treatment mode*						
Inpatient	17 (8%)	19 (9%)	25 (10%)	26 (9%)	5 (3%)	6 (3%)
Outpatient	195 (92%)	193 (91%)	228 (90%)	277 (91%)	142 (97%)	193 (97%)
Device history*						
No previous device	181 (85%)	180 (85%)	198 (78%)	239 (79%)	123 (84%)	168 (84%)
≥1 previous device inserted >3 months before study entry	26 (12%)	26 (12%)	46 (18%)	53 (18%)	21 (14%)	27 (14%)
≥1 previous device inserted <3 months before study entry	5 (2%)	6 (3%)	9 (4%)	11 (4%)	3 (2%)	4 (2%)
Baseline quality of life scores						
EQ5D index value	0.7 (0.3; -0.3 to 1.0)	0.8 (0.2; -0.2 to 1.0)	0.7 (0.3; -0.1 to 1.0)	0.7 (0.3; -0.3 to 1.0)	0.8 (0.2; 0.0 to 1.0)	0.8 (0.2; 0.0 to 1.0)
EQ5D health state score	70.6 (20.7; 10.0 to 100.0)	70.3 (18.6; 10.0 to 100.0)	71.0 (21.0; 0.0 to 100.0)	69.4 (19.8; 0.0 to 100.0)	74.3 (17.5; 30.0 to 100.0)	73.6 (19.6; 20.0 to 100.0)
QLQ-C30 global health status	65.3 (22.6; 0.0 to 100.0)	68.0 (21.1; 0.0 to 100.0)	66.0 (21.9; 0.0 to 100.0)	64.2 (22.1; 0.0 to 100.0)	67.8 (19.9; 0.0 to 100.0)	69.8 (20.6; 0.0 to 100.0)

Data are n (%), or mean (SD; range), unless specified. PICCs=peripherally inserted central catheters. Hickman=Hickman-type tunnelled catheter. PORTs=totally implanted ports. QLQ-C30=Quality of Life of Cancer Patients Questionnaire. *Stratification factor. †Percentages for type of cancer are calculated from the number of patients with either solid tumours or haematological malignancies.

Table 2: Baseline characteristics for all comparisons

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Interview	Analysis	Interpret	Discuss	Write
• a question/answer oriented activity	• identify relevant topics	• look for themes and evidence	• organize evidence to tell a story	• present clearly
• 10-15 min	• 10-15 min	• 10-15 min	• 10-15 min	• 10-15 min
• 10-15 min	• 10-15 min	• 10-15 min	• 10-15 min	• 10-15 min

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Background Hickman-type tunnelled catheters (Hickman), peripherally inserted central catheters (PICCs), and totally implanted ports (PORTs) are used to deliver systemic anticancer treatment (SACT) via a central vein. We aimed to compare complication rates and costs of the three devices to establish acceptability, clinical effectiveness, and cost-effectiveness of the devices for patients receiving SACT.

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Removal due to complications

	PICCs vs Hickman		PORTs vs Hickman		PORTs vs PICCs	
	PICCs (n=212)	Hickman (n=212)	PORTs (n=253)	Hickman (n=303)	PORTs (n=147)	PICCs (n=199)
Number of complications						
0	102 (48%)	109 (51%)	180 (71%)	172 (57%)	100 (68%)	106 (53%)
≥1	110 (52%)	103 (49%)	73 (29%)	131 (43%)	47 (32%)	93 (47%)
Complication type						
Inability to aspirate blood						
Patients	45 (21%)	33 (16%)	38 (15%)	42 (14%)	23 (16%)	37 (19%)
Complications	66 (38%)	43 (25%)	63 (48%)	60 (30%)	33 (39%)	55 (40%)
Venous thrombosis						
Patients	13 (6%)	10 (5%)	3 (1%)	7 (2%)	3 (2%)	22 (11%)
Complications	14 (8%)	10 (6%)	3 (2%)	7 (4%)	3 (4%)	24 (17%)
Pulmonary embolism						
Patients	6 (3%)	4 (2%)	3 (1%)	4 (1%)	3 (2%)	1 (<1%)
Complications	6 (4%)	4 (2%)	3 (2%)	4 (2%)	3 (4%)	1 (1%)
Any infection						
Patients	23 (11%)	63 (30%)	36 (14%)	77 (25%)	18 (12%)	16 (8%)
Complications	27 (16%)	78 (46%)	47 (36%)	102 (51%)	24 (28%)	16 (12%)
Laboratory confirmed bloodstream infection						
Patients	10 (5%)	41 (19%)	14 (6%)	49 (16%)	8 (5%)	7 (4%)
Complications	11 (6%)	43 (25%)	16 (12%)	54 (27%)	9 (11%)	7 (5%)
Suspected catheter-related bloodstream infection						
Patients	10 (5%)	18 (9%)	19 (8%)	15 (5%)	8 (5%)	5 (3%)
Complications	12 (7%)	23 (14%)	21 (16%)	16 (8%)	11 (13%)	5 (4%)
Exit site infection						
Patients	4 (2%)	19 (9%)	10 (4%)	26 (9%)	4 (3%)	4 (2%)
Complications	4 (2%)	22 (13%)	10 (8%)	32 (16%)	4 (5%)	4 (3%)
Mechanical failure						
Patients	31 (15%)	7 (3%)	2 (1%)	9 (3%)	4 (3%)	21 (11%)
Complications	31 (18%)	7 (4%)	2 (2%)	9 (5%)	4 (5%)	21 (15%)
Other						
Patients	23 (11%)	16 (8%)	14 (6%)	17 (6%)	16 (11%)	19 (10%)
Complications	29 (17%)	18 (11%)	14 (11%)	18 (9%)	18 (21%)	22 (16%)
Total number of complications	173	170	132	200	85	139
≥1 severe SIR complications,* percentage of patients with complications	28 (25%)	52 (50%)	33 (45%)	62 (47%)	16 (34%)	24 (26%)
Median device dwell time, days	113 (106–123)	158 (140–175)	367 (324–393)	165 (149–177)	393 (324–393)	119 (109–130)
Complications per catheter week	0.12 (0.02)	0.07 (0.01)	0.02 (0.00)	0.06 (0.01)	0.05 (0.02)	0.13 (0.02)
Infective complications per catheter week	0.02 (0.01)	0.04 (0.01)	0.01 (0.00)	0.03 (0.01)	0.02 (0.01)	0.02 (0.01)
Non-infective complications per catheter week	0.10 (0.02)	0.04 (0.01)	0.01 (0.00)	0.03 (0.01)	0.04 (0.02)	0.10 (0.02)
Planned removal or end of treatment	91 (50%)	99 (53%)	80 (56%)	131 (52%)	44 (59%)	85 (52%)
Removal due to complications	78 (42%)	61 (32%)	20 (14%)	80 (32%)	18 (24%)	63 (38%)
Removal due to other reasons	15 (8%)	28 (15%)	42 (30%)	40 (16%)	13 (17%)	17 (10%)
Total devices removed, percentage device insertions attempted	184 (91%)	188 (92%)	142 (58%)	251 (89%)	75 (52%)	165 (88%)
Total cost, £	1708 (1153–2262)	3262 (2227–4296)	2436 (1927–2946)	2481 (2007–2954)	2706 (1899–3513)	1041 (764–1316)
Cost per catheter week, £	248 (161–336)	374 (244–505)	210 (120–300)	257 (161–353)	263 (133–394)	304 (153–455)

Data are n (%), mean (SE), mean (95% CI), or median (95% CI), unless specified. Percentages for complications are calculated out of the total number of complications in that group. PICCs=peripherally inserted central catheters. Hickman=Hickman-type tunnelled catheters. PORTs=totally implanted ports. *Classed as Society of Interventional Radiology classification C or worse (see appendix p 7).

Table 3: Outcomes for all comparisons

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1	2	3	4	5
1	2	3	4	5

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... complicanze

Take home message

**PICC-port:
vantaggi**

Tecnici

Clinici

Estetici

Psicologici





Il Convegno Nazionale PICC-port Roma - 5 Dicembre 2022

Fabrizio Brescia

SOC Anestesia e Rianimazione – Team Accessi Vascolari
Centro di Riferimento Oncologico di Aviano

Grazie per
l'attenzione

