



Catheter securement in 2022

Subcutaneous anchorage of PICCs

*Fabrizio Brescia*



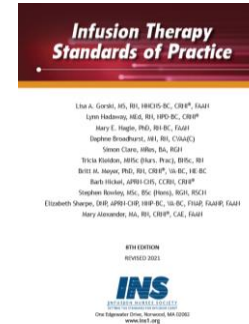
# OBJECTIVES OF ADEQUATE STABILIZATION

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Ensure the integrity of the device

Minimize the movement of the catheter at the exit site

Prevent dislocation of the catheter



# OBJECTIVES OF ADEQUATE STABILIZATION

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No interference with the evaluation and control of the exit site

No impact on blood flow or therapy infusion

**An integral part of the clinical-  
therapeutic path of patients**



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8TH EDITION

REVISED 2021

**INS**

Infusion Nurses Society

One Edgewater Drive, Norwood, MA 02062

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# INSERTION BUNDLE

MINIMIZE THE  
RISK OF  
COMPLICATIONS

Global use of  
US

US-guided  
venipuncture  
+ micro-  
introducer kit

Appropriate  
catheter/vein  
ratio

Appropriate  
aseptic  
technique

Optimal  
stabilization of  
the device

Tip location  
Tip  
navigation

# DISLOCATION - DEFINITION AND INCIDENCE

## Loss of the device or otherwise loss of function and central position of the catheter tip

Support Care Cancer  
DOI 10.1007/s00520-012-1554-0

ORIGINAL ARTICLE

### Peripherally inserted central catheters (PICCs) in the management of oncohematological patients submitted to autologous stem cell transplantation

Silvia Bellesi · Patrizia Chiusolo · Gennaro De Pascale · Mauro Pittiruti · Giancarlo Scoppettuolo · Elisabetta Metafani · Sabrina Giammarco · Federica Sorà · Luca Laurenzi · Giuseppe Leone · Simona Sica

Received: 29 March 2012 / Accepted: 23 July 2012  
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www.em-consulte.com

Médecine et maladies infectieuses 43 (2013) 350–355

Médecine et  
maladies infectieuses

Original article

Prospective follow-up of complications related to peripherally inserted central catheters<sup>☆,☆☆</sup>

*Suivi prospectif des complications associées aux cathéters veineux centraux insérés par voie périphérique*

C. Leroyer<sup>☆,\*</sup>, A. Lashéras<sup>☆</sup>, V. Marie<sup>☆</sup>, Y. Le Bras<sup>☆</sup>, T. Cartejét<sup>☆</sup>, M. Dupon<sup>☆</sup>, A.-M. Rogues<sup>☆</sup>

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Received 5 October 2012; received in revised form 30 April 2013; accepted 18 June 2013  
Available online 19 July 2013

CLINICAL STUDY

### Peripherally Inserted Central Catheters: Use at a Tertiary Care Pediatric Center

Craig Gibson, MBBS, Bairbre L. Connolly, MD, FRCPC, Rahim Moineddin, PhD, Sanjay Mahant, MD, Doina Filipescu, BS, and Joao G. Amaral, MD

JVA

ISSN 1129-7298

J Vasc Access 2017; 18 (5): 408-414  
DOI: 10.5301/jva.5000738

ORIGINAL RESEARCH ARTICLE

### Impact of arm selection on the incidence of PICC complications: results of a randomized controlled trial

France Paquet<sup>1,2</sup>, Louis-Martin Boucher<sup>1,2</sup>, David Valenti<sup>1,2</sup>, Richard Lindsay<sup>3</sup>

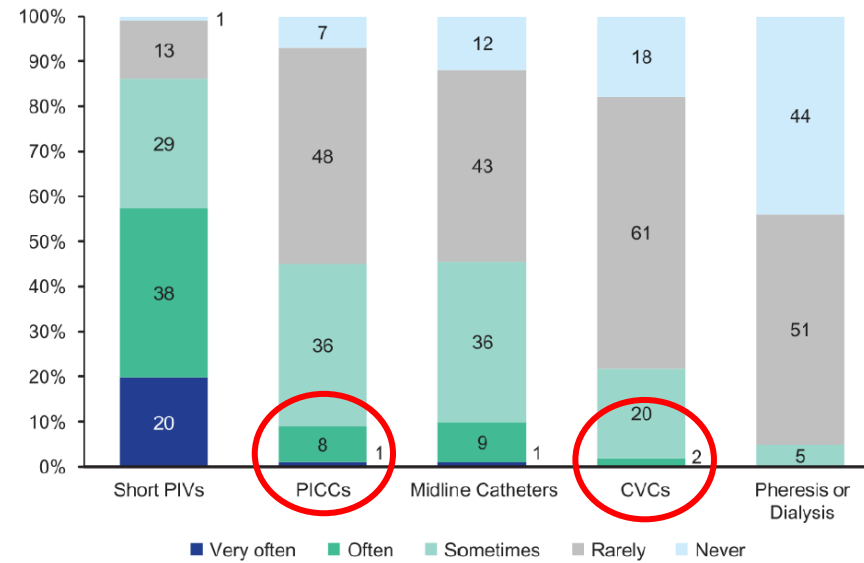
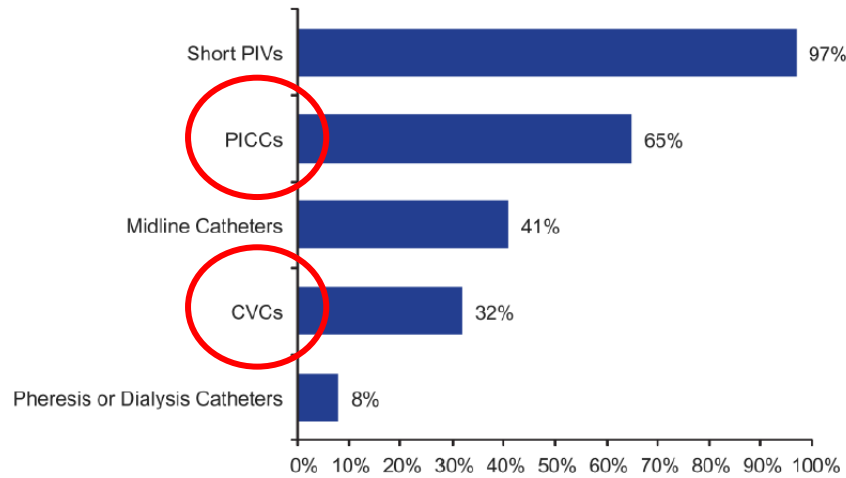
<sup>1</sup> McGill University Health Centre, Montreal, Quebec - Canada

<sup>2</sup> McGill University, Montreal, Quebec - Canada

<sup>3</sup> Belfast Health and Social Care Trust, Knockbracken Healthcare, Belfast - UK

5-15%

# DISLOCATION - INCIDENCE



ORIGINAL ARTICLE CE

**Impact and Safety Associated with Accidental Dislodgement of Vascular Access Devices: A Survey of Professions, Settings, and Devices**  CrossMark

*Nancy Moureau, RN, PhD, CRNI®, CPUI, VA-BC™*  
*PICC Excellence Inc., Hartwell, GA*

JAVA 2018

# DISLOCATION

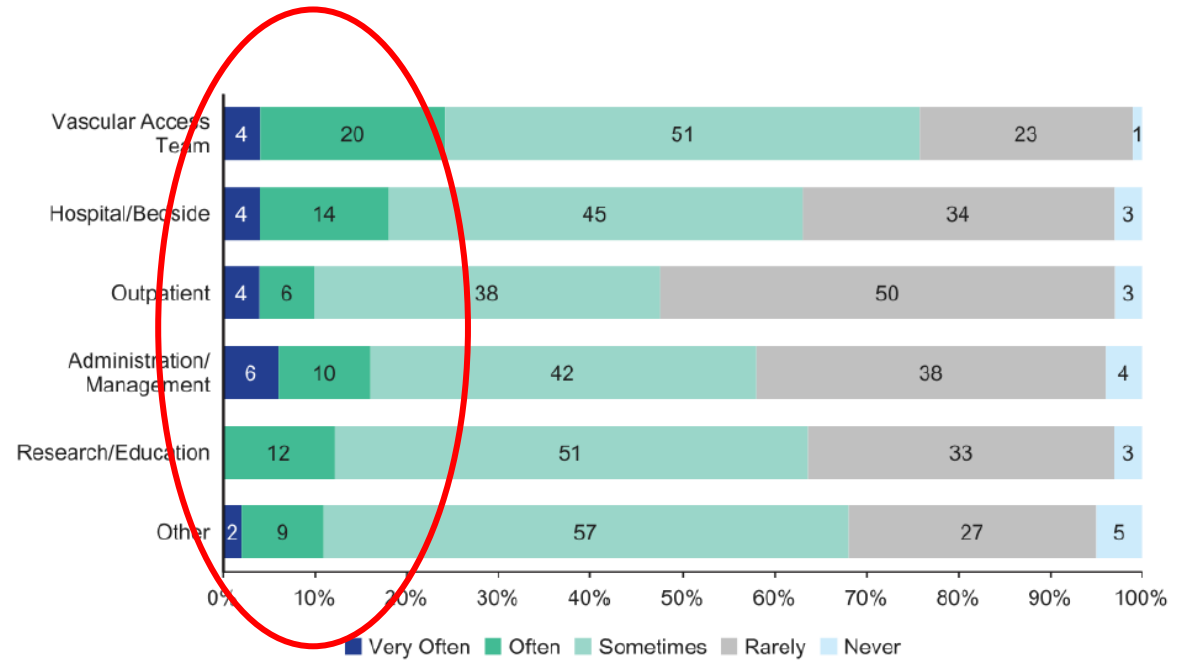
ORIGINAL ARTICLE **CE**

**Impact and Safety Associated with Accidental Dislodgement of Vascular Access Devices: A Survey of Professions, Settings, and Devices**

*Nancy Moureau, RN, PhD, CRNI®, CPUI, VA-BC™*  
*PICC Excellence Inc., Hartwell, GA*

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JAVA 2018



# DISLOCATION - CAUSES

- factors dependent on the patient's cognitive status
- factors related to the actual efficacy/inefficacy of the securement
- factors related to the active or passive mobilization of the patient

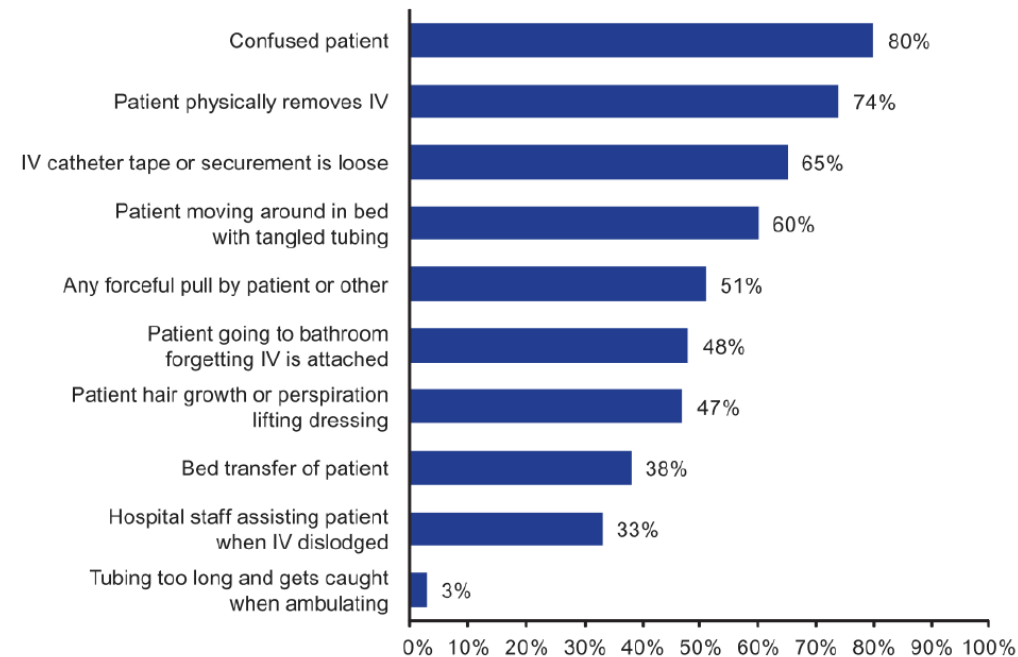
ORIGINAL ARTICLE CE

**Impact and Safety Associated with Accidental Dislodgement of Vascular Access Devices: A Survey of Professions, Settings, and Devices**

Nancy Moureaux, RN, PhD, CRNI®, CPUI, VA-BC™  
PACC Excellence Inc., Hartwell, GA

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JAVA 2018





# DISLOCATION – CLINICAL IMPACT

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Interruption of therapy

Loss of vascular access

Need for repositioning of the VAD

Discomfort for the patient

Additional costs

# VAD STABILIZATION SYSTEMS

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## Engineered Securement Devices (ESDs)

Adhesive  
Engineered  
Securement Devices  
(AESDs)

Sutures

Adhesive  
Sutureless  
Devices

Stabilization  
systems integrated  
into the dressing

# Sutureless Securement Device Reduces Complications of Peripherally Inserted Central Venous Catheters

Alvin J. Yamamoto, MD, Jeffrey A. Solomon, MD, Michael C. Soulen, MD, James Tang, MD, Kim Parkinson, RN, Richard Lin, MD, and Gregory J. Schears, MD

J Vasc Interv Radiol 2002; 13:77-81

## Never use sutures

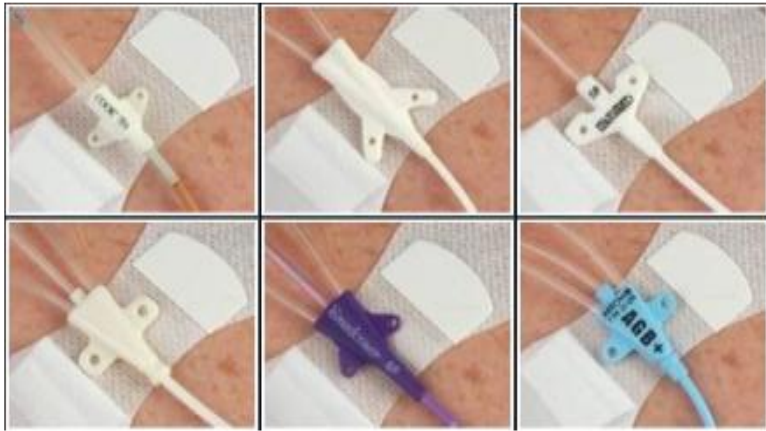


- High infectious risk
- High dislocation rates
- Major safety concern for operators – needle-stick injury

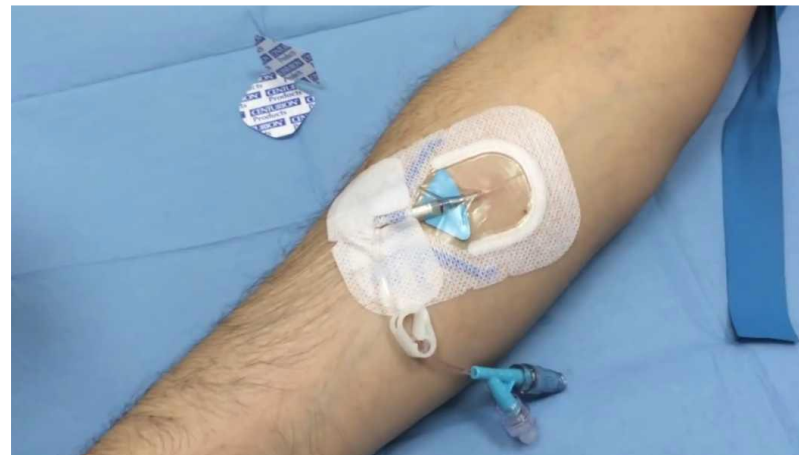


# ADHESIVE SUTURELESS DEVICES

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Overcome the  
poor performance  
of the sutures...



# ADHESIVE SUTURELESS DEVICES

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- Weekly change of the system
- Mobilization of the device from reduced adhesiveness
- Strong adhesives may require the use of specific solvents to remove residues
- Movement “in and out” at the exit-site
- Risk of partial dislocation during dressing and AESD changes
- Local skin irritation during changes, repositioning in a different area: dislocation

Original research article

**Intravascular catheter migration: A cross-sectional and health-economic comparison of adhesive and subcutaneous engineered stabilisation devices for intravascular device securement**

Dympna McParlan, L Edgar, M Gault, S Gillespie, R Menelly and M Reid

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Vascular Access

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## Results

In the 2013 period, 1111 PICCs were placed. During this period, 66 (5.94%) PICCs had migration or dislodgment issues that required replacement of the catheter. Data collection did not include small migratory incidences that did not require device replacement. Additional costs associated with PICC migration such as confirmatory radiography and complication interventions for occlusion management were not recorded. PICC migration is often underreported and was difficult to capture through standard documentation methods despite observation from the IST.

# ADHESIVE SUTURELESS DEVICES

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MARSI has been defined as “an occurrence in which erythema and/or other manifestation of cutaneous abnormality (including, but not limited to, vesicle, bulla, erosion, or tear) persists 30 minutes or more after removal of the adhesive”

Medical Adhesive Related Skin Injury

**MARSI**

WOUND CARE



*Medical Adhesives and Patient Safety:  
State of the Science*

*Consensus Statements for the Assessment, Prevention, and  
Treatment of Adhesive-Related Skin Injuries*

Laurie McNichol ■ Carolyn Lund ■ Ted Rosen ■ Mikel Gray



J Wound Ostomy Continence Nurs. 2013;40(4):1-15  
Published by Lippincott Williams & Wilkins



# VAD STABILIZATION SYSTEMS

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## Engineered Securement Devices (ESDs)

Subcutaneous  
Engineered  
Securement Device  
(SESD)

Sutures

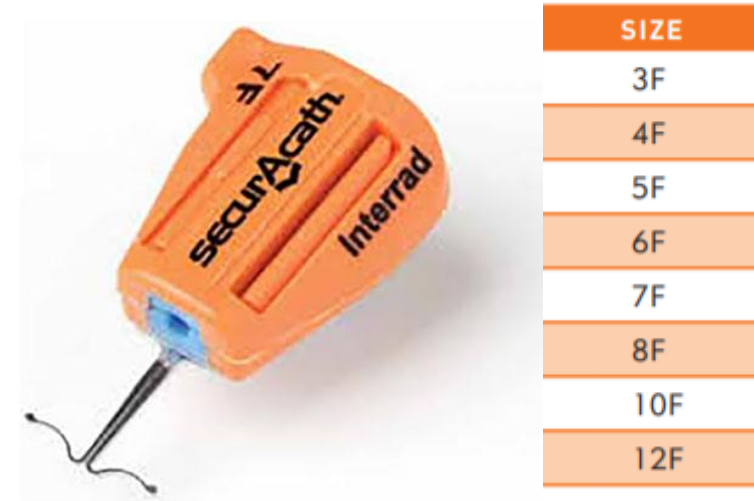
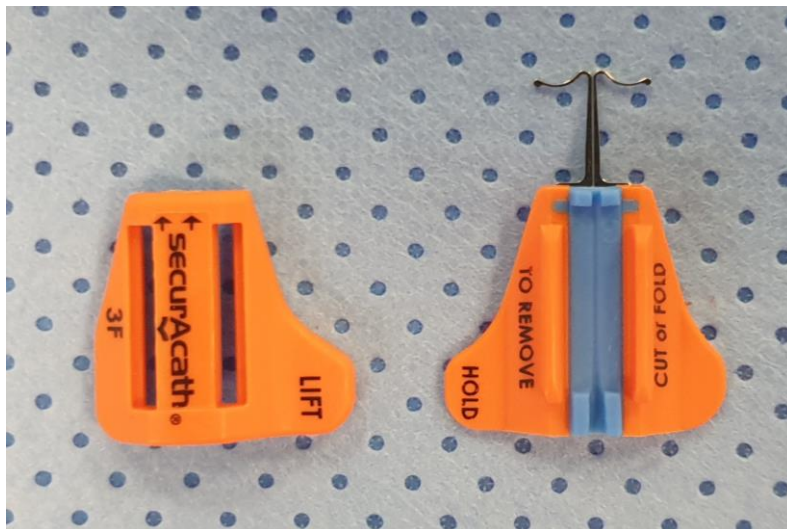
Adhesive  
Sutureless  
Devices

Stabilization  
systems  
integrated  
into the  
dressing

Subcutaneous  
anchorage  
securement

# SUBCUTANEOUS ANCHORAGE SECUREMENT

SAS devices allows a stabilization of the catheter through the use of nitinol bars anchored in the subcutaneous tissue

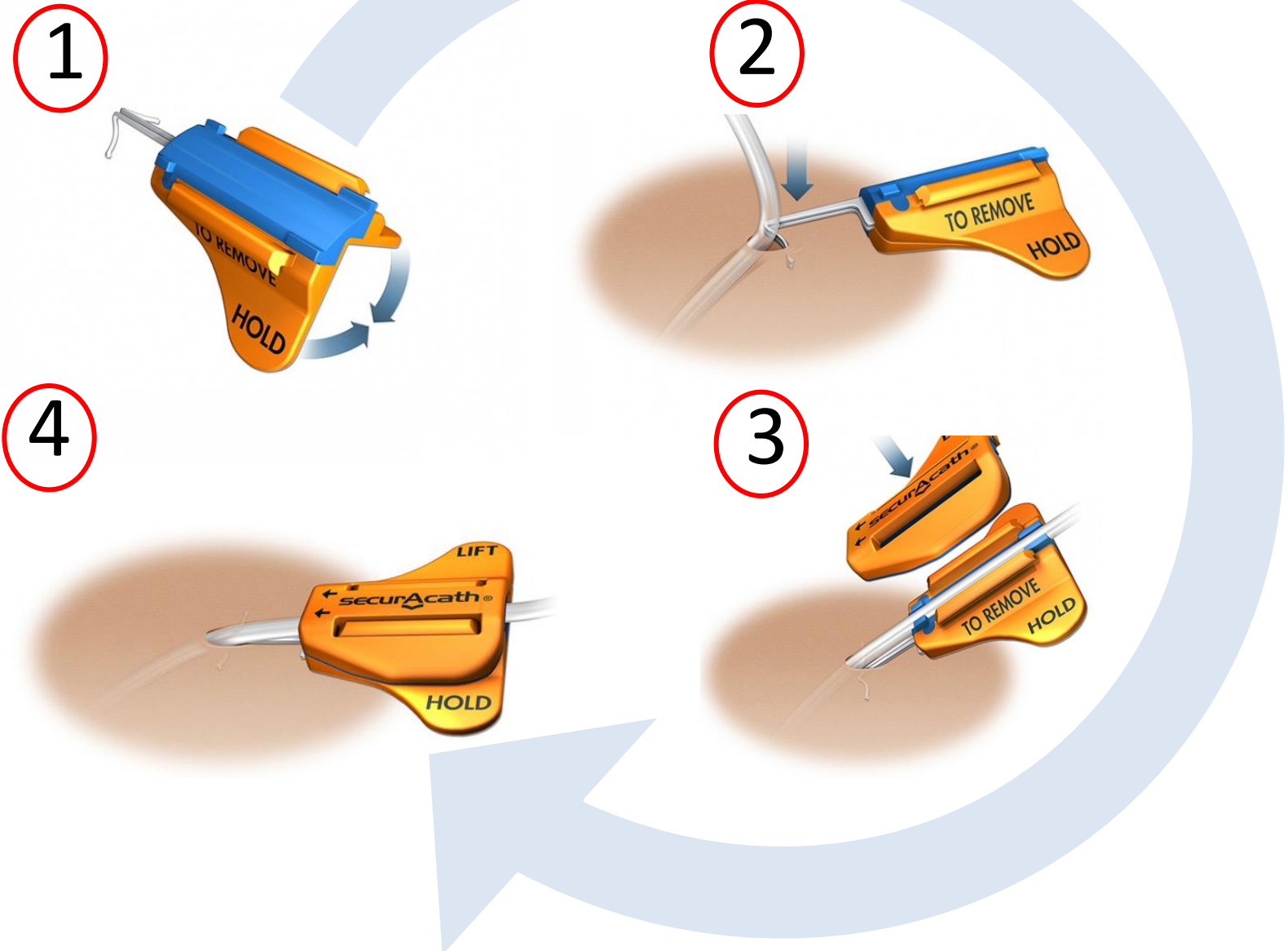


One device

... from placement to removal

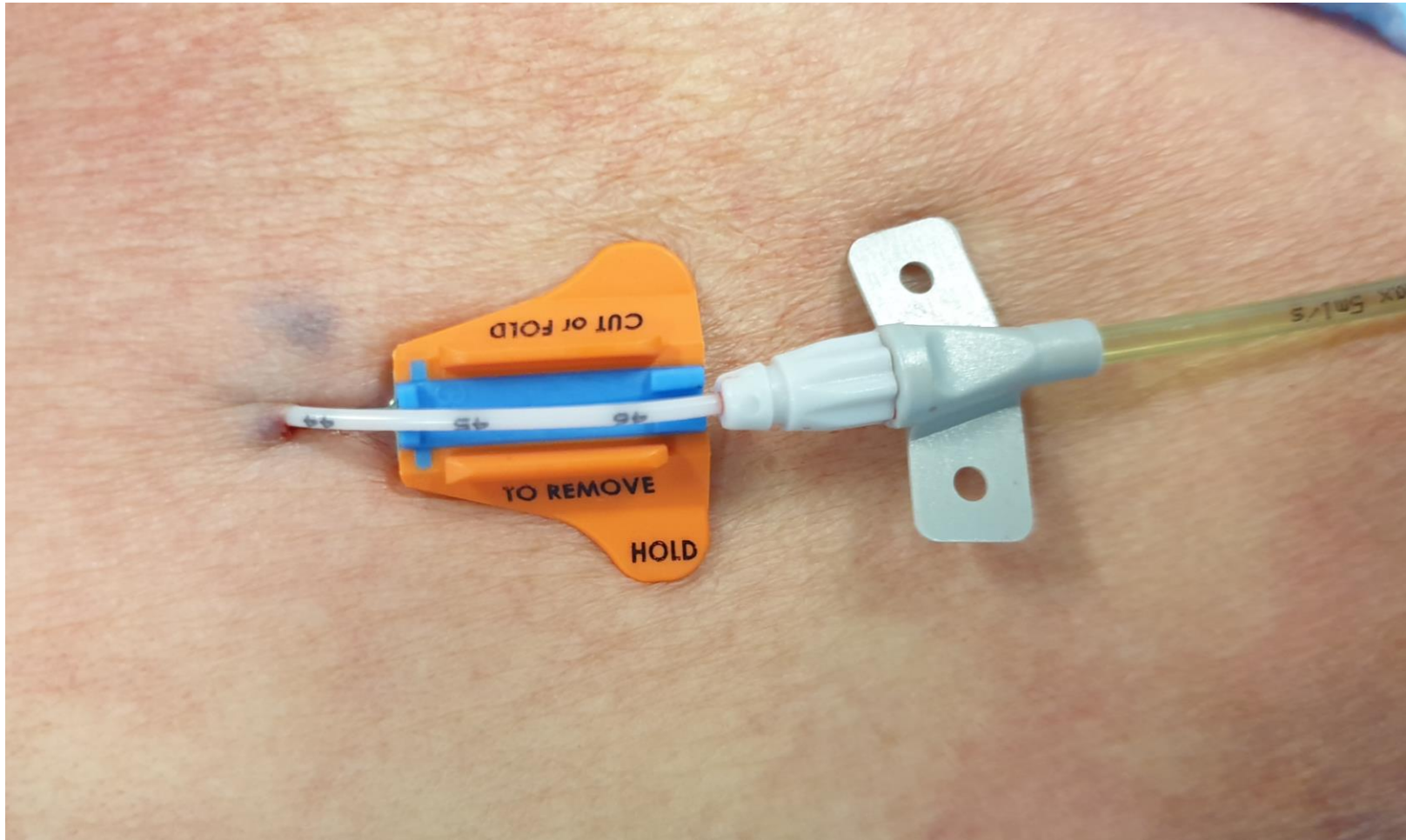


# SUBCUTANEOUS ANCHORAGE SECUREMENT



# SUBCUTANEOUS ANCHORAGE SECUREMENT

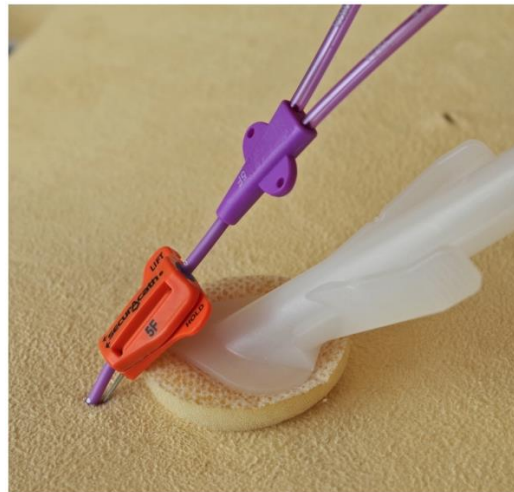
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# SAS - ADVANTAGES

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- not require periodic replacement
- complete disinfection of the exit site
- “in and out” micromovements of the catheter at the exit site are eliminated
- efficacy is not affected by characteristics of the skin



# SAS - DISLOCATION

Study	Design	Population/ no. of patients	Catheter type	Primary outcome	Results	Dislodgment N (%)	Success rate	Adverse events	Cost analysis
Cordovani and Cooper <sup>3</sup>	Multicentre Prospective Observational	Adult/74	CICC 7 Fr	Successful securement	72(97%)	2(2.7%)	100%	None	No
Egan et al. <sup>2</sup>	Multicentre Prospective Observational	Adult/68	PICC 5 Fr	Successful securement	62(91.2%)	None	100%	6(8.8%)	No
Hughes <sup>4</sup>	Observational	Adult/31	PICC	Successful securement	30(96.7%)	One moved out of 1 cm (3.3%)	100%	25% difficult removal; 22.5% other	Yes
Dolcino et al. <sup>6</sup>	Prospective Observational retrospectively controlled	Pediatric/ 51	Tunneled- cuffed CICC	Incidence of dislodgment within first 30 days	2(1.1%)	2(1.1%)	NR	NR	No
Zerla et al. <sup>5</sup>	Prospective Observational	Adult/30	PICC 4 Fr	Incidence of dislodgment	None	None	NR	NR	Yes
Goossens et al. <sup>7</sup>	RCT (StatLock™ vs Securacath™)	Adult/105	PICC 4-5 Fr	Nursing time for dressing change	7.3 vs 4.3 min (p < 0.0001)	2(4.3%) vs 3(5.9%) p = 1			No
Pittiruti et al. <sup>8</sup>	Prospective Observational	Neonatal; Pediatric; Adult/190	PICC; CICC; FICC Tunneled/ untunneled	Successful securement	187(98.4%)	3(1.6%)	99%	5(2.6%) Local inflammation	Yes

SAS: subcutaneously anchored securement; NR: not reported; CICC: centrally inserted central catheters; PICC: peripherally inserted central catheters; FICC: femorally inserted central catheters.

Original research article

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## GAVeCeLT-WoCoVA Consensus on subcutaneously anchored securement devices for the securement of venous catheters: Current evidence and recommendations for future research

Fulvio Pinelli<sup>1</sup>, Mauro Pittiruti<sup>2</sup>, Ton Van Boxtel<sup>3</sup>, Giovanni Barone<sup>4</sup>,  
Roberto Biffi<sup>5</sup>, Giuseppe Capozzoli<sup>6</sup>, Alessandro Crocoli<sup>7</sup>, Stefano Elli<sup>8</sup>,  
Daniele Elisei<sup>9</sup>, Adam Fabiani<sup>10</sup>, Cristina Garrino<sup>11</sup>, Ugo Graziano<sup>12</sup>,  
Luca Montagnani<sup>13</sup>, Alessio Pini Prato<sup>14</sup>, Giancarlo Scoppettuolo<sup>15</sup>, Nicola Zadra<sup>16</sup>,  
Clelia Zanaboni<sup>17</sup>, Pietro Zerla<sup>18</sup>, Evangelos Konstantinou<sup>19</sup>, Matt Jones<sup>20</sup>,  
Hervé Rosay<sup>21</sup>, Liz Simcock<sup>22</sup>, Marguerite Stas<sup>23</sup> and Gilda Pepe<sup>15</sup>

# SAS - DISLOCATION

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Original research article

**GAVeCeLT-WoCoVA Consensus on subcutaneously anchored securement devices for the securement of venous catheters: Current evidence and recommendations for future research**

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## Attention to...

- adequate choice of the size of the SAS

# SAS - DISLOCATION

Original research article

**GAVeCeLT-WoCoVA Consensus on subcutaneously anchored securement devices for the securement of venous catheters: Current evidence and recommendations for future research**

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## Attention to...

- adequate choice of the size of the SAS
- subcutaneous placement





# SAS - DISLOCATION

Original research article

**GAVeCeLT-WoCoVA Consensus on subcutaneously anchored securement devices for the securement of venous catheters: Current evidence and recommendations for future research**

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## Attention to...

- adequate choice of the size of the SAS
- subcutaneous placement
- adequate training for positioning

Original research article

**Intravascular catheter migration: A cross-sectional and health-economic comparison of adhesive and subcutaneous engineered stabilisation devices for intravascular device securement**

Dympna McParlan, L. Edgar, M Gault, S Gillespie, R Menelly and M Reid

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### Method

A before and after analysis was performed comparing all PICCs placed in 2013 to the post-device implementation period, beginning in 2015, providing 2 years of data. The subcutaneous ESD was introduced to staff during June 2014, allowing the IST to provide 6 months of dedicated education before device implementation and data collection started. During 2014, the currently used AESD was maintained for device securement. All patients were monitored for catheter migration and dislodgement using the PICC History Sheet (See Supplemental Material) and results were kept in an electronic patient database.

### Results

In the 2013 period, 1111 PICCs were placed. During this period, 66 (5.94%) PICCs had migration or dislodgment issues that required replacement of the catheter. Data collection did not include small migratory incidences that did not require device replacement. Additional costs associated with PICC migration such as confirmatory radiography and complication interventions for occlusion management were not recorded. PICC migration is often underreported and was difficult to capture through standard documentation methods despite observation from the IST.

By the end of the subcutaneous device implementation period (January–December 2015), 1139 PICCs were successfully inserted with zero (0.0%) catheter migrations requiring replacement reported.

1139 patients: no dislocation

# SAS - TUNNELING

**Table 1.** RAVESTO—Rapid Assessment of Vascular Exit Site and Tunneling Options.


Central venous access device	Type and path of tunnel	Indications for tunneling
PICC	Tunnel to Dawson's green area	Puncture site in Dawson's yellow area; non-hospitalized patients with expected long intravenous treatment
CICC (supraclavicular puncture)	Tunnel to infraclavicular area	Long term intravenous treatment in non-hospitalized patients (antibiotics, parenteral nutrition, chemotherapy); expected difficulties in management of the exit site in hospitalized patients (beard, humidity, tracheostomy, instability, etc.)
	Tunnel to arm	Compromised skin integrity of the chest area; oral or endotracheal secretions over chest; implanted device on ipsilateral chest; chest surgery; contracted shoulder; etc.
	Tunnel to back	Cognitive disorder resulting in device removal; contraindication to chest or arm exit site
CICC (infraclavicular puncture)	Tunnel to lower chest	Long term intravenous treatment in non-hospitalized patients (antibiotics, parenteral nutrition, chemotherapy); expected problems in management of the exit site in hospitalized patients (tracheostomy, etc.)
	Tunnel to arm	Compromised skin integrity of the chest area; oral or endotracheal secretions over chest; implanted device on ipsilateral chest; chest surgery; contracted shoulder; etc.
	Tunnel to back	Cognitive disorder resulting in device removal; contraindication to chest or arm exit site
FICC (puncture at the groin)	Tunnel to the abdomen	Non-emergency line in walking patients with contraindication to PICC/ CICC
	Tunnel to mid-thigh	Non-emergency line in bedridden patients with contraindication to PICC/ CICC
FICC (puncture at mid-thigh)	Tunnel to the abdomen	Non-emergency line in walking patients with contraindication to PICC/ CICC
	Tunnel to distal thigh	Long term intravenous treatment in bedridden patients with contraindication to PICC/CICC

*Techniques in vascular access*

JVA | The Journal of Vascular Access

## Rapid Assessment of Vascular Exit Site and Tunneling Options (RAVESTO): A new decision tool in the management of the complex vascular access patients

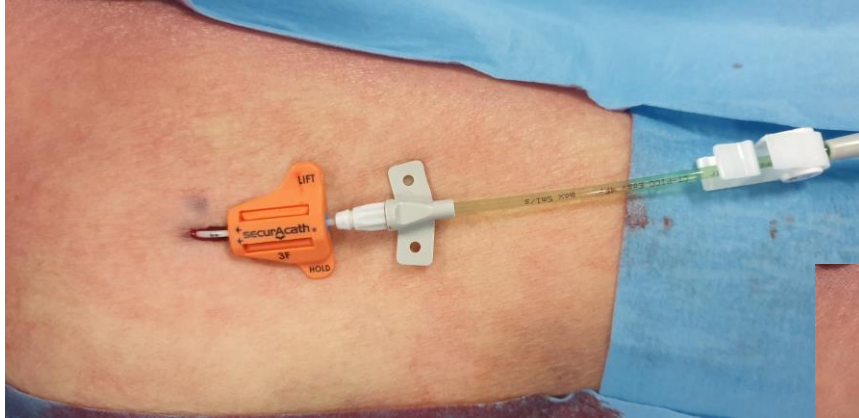
Matthew D Ostroff<sup>1</sup> , Nancy Moureau<sup>2</sup> and Mauro Pittiruti<sup>3</sup> 

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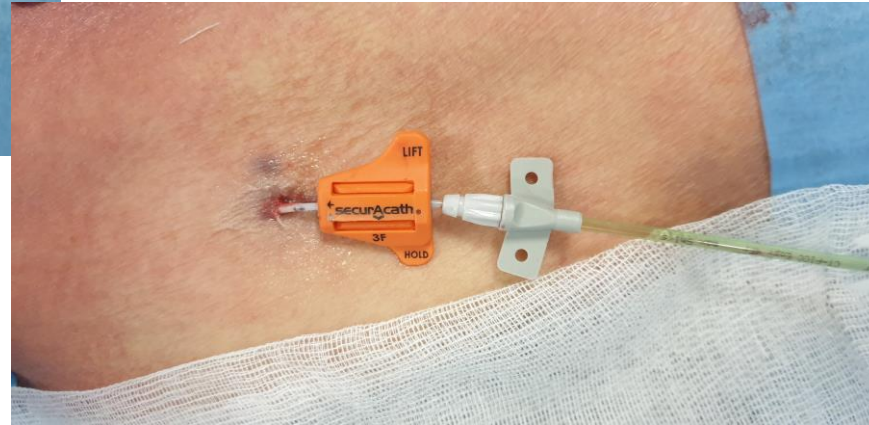
# SAS - GLUE

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Stop bleeding

Synergistic effect



Reduction of infectious risk

Reduction of the risk of dislocation

# SAS – COVID-19

Pittiruti and Pinelli *Critical Care* (2020) 24:269  
<https://doi.org/10.1186/s13054-020-02997-1>

Critical Care

COMMENTARY

Open Access

Recommendations for the use of vascular access in the COVID-19 patients: an Italian perspective



Mauro Pittiruti<sup>1\*</sup>, Fulvio Pinelli<sup>2</sup> on behalf of the GAVeCeLT Working Group for Vascular Access in COVID-19

As the risk of central venous catheter dislodgment is particularly high in the COVID-19 patient, particularly during the maneuvers of pronation-supination, consider the use of subcutaneously anchored securement.

- complexity of clinical cases
- frequent pronation of patients
- exceptional workload in ICU

Editorial

**Vascular access in COVID-19 patients: Smart decisions for maximal safety**

Giancarlo Scoppettuolo<sup>1</sup>, Daniele Guerino Biasucci<sup>2</sup> and Mauro Pittiruti<sup>3</sup>

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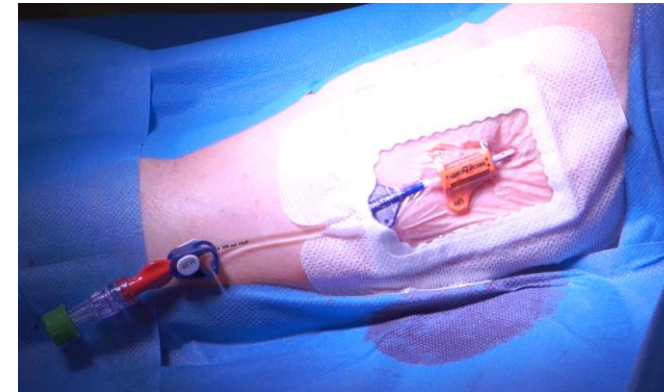
Editorial

**Choice and management of vascular access in the context of COVID-19 outbreak in Italy: Recommendations from clinical practice**

Davide Vailati<sup>1</sup>, Giorgia Montrucchio<sup>2</sup>, Vittorio Cerotto<sup>3</sup>, Giuseppe Capozzoli<sup>4</sup>, Fabio Gori<sup>5</sup>, Flavia Petrin<sup>6,7</sup> and Luca Brazzi<sup>2,8</sup>, on behalf of the Italian Society of Anesthesia and Intensive Care (Società Italiana di Anestesia, Analgesia, Rianimazione e Terapia Intensiva, SIAARTI)

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# Subcutaneously anchored securement for peripherally inserted central catheters: Immediate, early, and late complications

Fabrizio Brescia<sup>1</sup>, Mauro Pittiruti<sup>2</sup>, Laura Roveredo<sup>1</sup>, Chiara Zanier<sup>1</sup>, Antonietta Morabito<sup>1</sup>, Elisabetta Santarossa<sup>1</sup>, Valentina Da Ros<sup>3</sup>, Marcella Montico<sup>4</sup> and Fabio Fabiani<sup>1</sup>

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<sup>2</sup>Department of Surgery, Fondazione Policlinico Universitario "A.Gemelli" IRCCS, Rome, Italy

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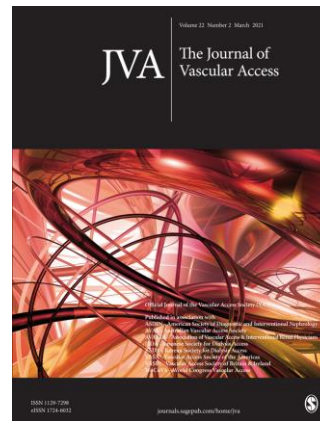
## Methods

### *Study design and setting*

This is a retrospective cohort study conducted in the Unit of Anesthesia, Intensive Care Medicine and Vascular Access Team of CRO National Cancer Institute, a Clinical and Research Cancer Institute located in Aviano (PN), Italy. We analyzed all PICCs secured with SAS in cancer patients, during the last 3 years (2018–2020). The SAS device used was the only currently available for clinical use, Securacath (Interrad Medical).

# Subcutaneously anchored securement for peripherally inserted central catheters: Immediate, early, and late complications

Fabrizio Brescia<sup>1</sup> , Mauro Pittiruti<sup>2</sup> , Laura Roveredo<sup>1</sup>, Chiara Zanier<sup>1</sup>, Antonietta Morabito<sup>1</sup>, Elisabetta Santarossa<sup>1</sup>, Valentina Da Ros<sup>3</sup>, Marcella Montico<sup>4</sup> and Fabio Fabiani<sup>1</sup>



## *Technique of PICC insertion*

PICC insertion was performed by experienced practitioners of our Vascular Access Team. In all patients, the procedure was performed according to our local insertion bundle for PICC insertion, which includes: pre-procedural ultrasound vascular assessment following the RaPeVA protocol (RaPeVA= Rapid Peripheral Vein Assessment),<sup>11</sup> measurement of vein diameter and respect for a catheter/vein ratio less than or equal to 1:3, skin antisepsis with 2% chlorhexidine, maximal barrier precautions, ultrasound-guided venipuncture, use of intracavitary electrocardiography method to verify the correct position of the tip of the catheter at the cavo-atrial junction, location of the exit site in Dawson's green zone (adopting tunneling from the yellow to the green zone, if necessary),<sup>12</sup> catheter securement with SAS, and sealing of the exit site with cyanoacrylate glue. Subsequent dressings and saline flushing of the PICC were performed weekly. The care and maintenance of the devices was entrusted to specialized nurses of our Access Vascular Team, according to institutional protocols.

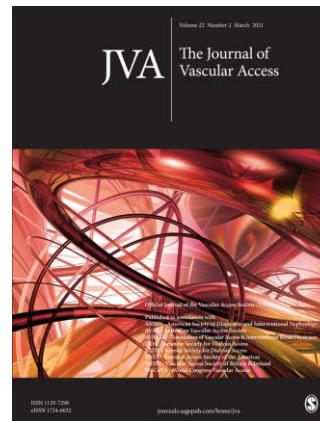
## *Outcomes*

Primary endpoints were (a) the efficacy of SAS, in terms of reducing the risk of dislocation and the need to reposition the vascular access device, (b) as well as its safety, evaluated investigating the incidence of immediate complications during SAS placement (difficulty, pain, etc.), early complications, that is, within 48 h (pain, local bleeding, etc.) and late complications (pain, malfunction, local or systemic infection, reversible or irreversible occlusion, catheter-related venous thrombosis, skin lesions due to the nitinol anchors, pressure ulcer of the device on the skin, etc.).



# Subcutaneously anchored securement for peripherally inserted central catheters: Immediate, early, and late complications

Fabrizio Brescia<sup>1</sup>, Mauro Pittiruti<sup>2</sup>, Laura Roveredo<sup>1</sup>, Chiara Zanier<sup>1</sup>, Antonietta Morabito<sup>1</sup>, Elisabetta Santarossa<sup>1</sup>, Valentina Da Ros<sup>3</sup>, Marcella Montico<sup>4</sup> and Fabio Fabiani<sup>1</sup>



## Results

A total of 639 patients had a PICC inserted and secured with SAS in the last 3 years (2018–2020) (Table 1).

PICCs of different brands and calibers were inserted: 254 Lifecath PICC Easy 4 Fr (Vygon), 114 Lifecath PICC Easy 5 Fr (Vygon), 97 HealthPICC 4 Fr single-lumen (Plan-1-Health), 153 HealthPICC 5 Fr single-lumen (Plan-1-Health), 21 HealthPICC 5 Fr double-lumen (Plan-1-Health). Indications for PICC insertion was chemotherapy in 120 patients, parenteral nutrition and chemotherapy in 410 patients, and parenteral nutrition in 109 patients.

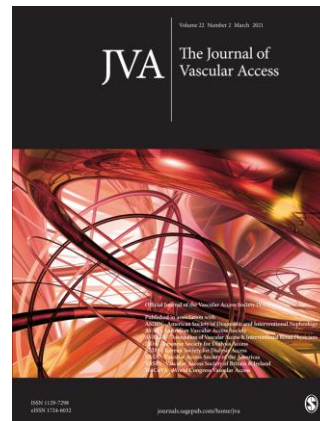
DISLOCATIONS: 3 patients with psychomotor agitation  
4 mismatch between the size of the catheter and the size of the SAS

As regards the effectiveness of securement with SAS, we recorded dislodgment only in seven patients (1.1%): three of these patients were non-collaborative patients with psychomotor agitation. In the remaining four cases, dislodgment occurred due to a mismatch between the size of the catheter and the size of the SAS. This was not related to an error of the operator but to an actual inconsistency of the caliber of the catheter as stated by the manufacturer. In fact, all four cases of dislodgment occurred with 4 Fr LifeCath PICC Easy (Vygon) secured with 4 Fr SAS or with 5 Fr LifeCath PICC Easy (Vygon) secured with 5 Fr SAS. In the early phase of our experience, noting this issue, we understood that the actual size of these catheters is slightly smaller than that the figure declared by the manufacturer. After these unexpected dislodgments, we have been using 3 Fr SAS for 4 Fr Lifecath PICC Easy and 4 Fr SAS for 5 Fr Lifecath PICC Easy, thus eliminating the risk of dislodgment.

No significant immediate complication during SAS placement was reported.

# Subcutaneously anchored securement for peripherally inserted central catheters: Immediate, early, and late complications

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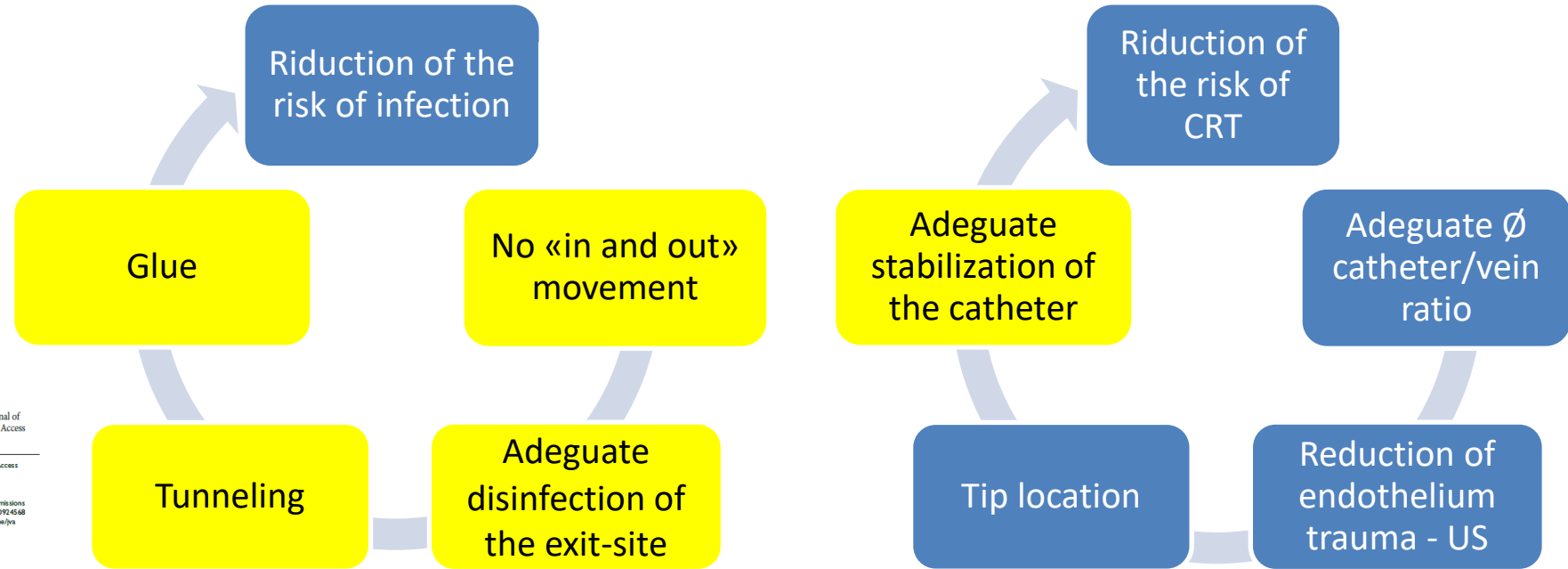
**Table 2.** Early complications (within 48 h).

	N (%)	95% CI
PICC malfunction	0 (0.00)	—
Bleeding or hematoma at the exit-site	0 (0.00)	—
Skin ecchymosis	24 (3.8%)	2.4%–5.5%
Local pain at the exit-site	0 (0.00)	—
Early infection	0 (0.00)	—

**Table 3.** Late complications (analysis of 93,078 catheter days).

	N (%)	95% CI
<u>Catheter-related bloodstream infection (CRBSI)</u>	16 (2.5)	1.4–4.0
<u>Symptomatic catheter-related venous thrombosis</u>	12 (1.9)	1.0–3.3
<u>Reversible lumen occlusion</u>	15 (2.3)	1.3–3.8
Irreversible lumen occlusion	0 (0.00)	—
<u>Pressure ulcers and painful inflammation</u>	17 (2.66)	1.6–4.2
	<u>Incidence/1000 catheter days</u>	
<u>Catheter-related bloodstream infection (CRBSI)</u>	<u>0.17</u>	0.10–0.28

# SAS – INFECTION AND THROMBOSIS



Original research article

**GAVeCeLT-WoCoVA Consensus on subcutaneously anchored securement devices for the securement of venous catheters: Current evidence and recommendations for future research**

JVA | The Journal of Vascular Access

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## Conclusion

There is no evidence that SAS may be effective in reducing other catheter-related complications such as venous thrombosis or exit site infection or bloodstream infection. There is no evidence either that they might increase the incidence of these or other major catheter-related complications.

**Theoretical advantage**

# SAS – INFECTION

> Am J Infect Control. 2020 Jun 17;S0196-6553(20)30560-5. doi: 10.1016/j.ajic.2020.06.178.  
Online ahead of print.

## Catheter Securement Impact on PICC-related CLABSI: A University Hospital Perspective

M S Rowe <sup>1</sup>, K Arnold <sup>2</sup>, T R Spencer <sup>3</sup>



Studio retrospettivo osservazionale: 7779 PICC 2015-2018

Device	CLABSI (n=47)	No CLABSI (n=7732)	Total	Cumulative Incidence
AESD	15	823	838	1.79%
SESD	32	6909	6941	0.46%
			<b>Risk Ratio</b>	<b>3.88</b>
			<b>Percent Relative Effect</b>	<b>288%</b>

Table 3. CLABSI by stabilization device.



# SAS – COST EFFECTIVENESS

**JVA**  
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J Vasc Access 2017; 18 (3): 238-242  
DOI: 10.5301/jva.5000655  
ORIGINAL RESEARCH ARTICLE

## Evaluating safety, efficacy, and cost-effectiveness of PICC securement by subcutaneously anchored stabilization device

Pietro Antonio Zerla<sup>1</sup>, Antonio Canelli<sup>2</sup>, Lidia Cerne<sup>1</sup>, Giuseppe Caravella<sup>2</sup>, Alessandra Gilardini<sup>2</sup>, Giuseppe De Luca<sup>3</sup>, Ana Maria Arlicsteanu<sup>4</sup>, Raffaele Venezia<sup>4</sup>

**TABLE II - Cost comparison between adhesive stabilization and subcutaneously anchored sutureless device (SAS)**

	SAS	Adhesive stabilization device
Maintenance performed	709	709
No. devices used	30	709
Device cost (€)	30	6
Stabilization total cost (€)	900	4.254
SAS savings (€)	3.354	

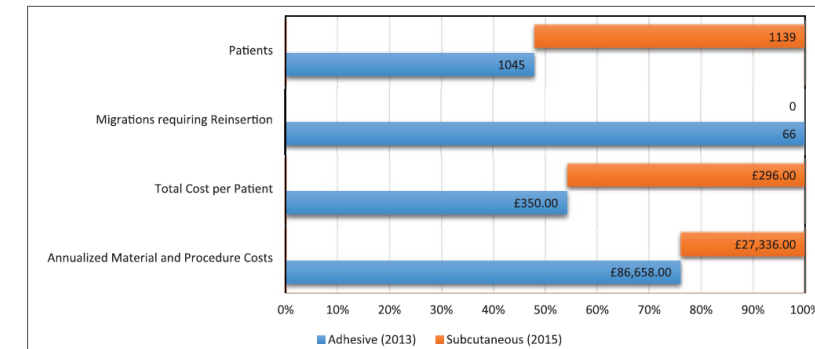
Original research article

## Intravascular catheter migration: A cross-sectional and health-economic comparison of adhesive and subcutaneous engineered stabilisation devices for intravascular device securement

Dympna McParlan, L Edgar, M Gault, S Gillespie, R Menelly and M Reid

**JVA** | The Journal of Vascular Access

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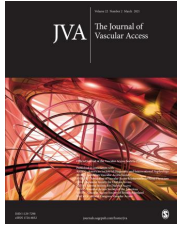


**Graph 1.** Comparison between adhesive and subcutaneous devices groups, highlighting costs per patient, reinsertions and material costs.

when the catheter is meant to remain in place for more than 5-6 weeks or when a high risk of dislodgment is anticipated

# CONCLUSIONS

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## Subcutaneously anchored securement for peripherally inserted central catheters: Immediate, early, and late complications

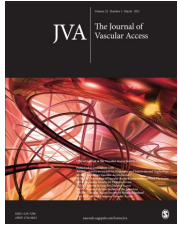
Fabrizio Brescia<sup>1</sup>, Mauro Pittiruti<sup>2</sup>, Laura Roveredo<sup>1</sup>, Chiara Zanier<sup>1</sup>, Antonietta Morabito<sup>1</sup>, Elisabetta Santarossa<sup>1</sup>, Valentina Da Ros<sup>3</sup>, Marcella Montico<sup>4</sup> and Fabio Fabiani<sup>1</sup>

## SAFETY AND PROTECTION

- Subcutaneously anchored securement of PICCs is associated with very low risk of dislodgment and that this risk is limited to
- Non-collaborative patients: SAS must surely be used as securement, but they are not enough, since some other strategies should be added, such as **tunneling** the catheter so to move the exit site far from the hands away to an area not reachable by the patient and safer during mobilization of the patient – RAVESTO protocol

# CONCLUSIONS

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## Subcutaneously anchored securement for peripherally inserted central catheters: Immediate, early, and late complications

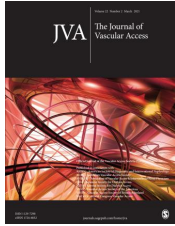
Fabrizio Brescia<sup>1</sup>, Mauro Pittiruti<sup>2</sup>, Laura Roveredo<sup>1</sup>, Chiara Zanier<sup>1</sup>, Antonietta Morabito<sup>1</sup>, Elisabetta Santarossa<sup>1</sup>, Valentina Da Ros<sup>3</sup>, Marcella Montico<sup>4</sup> and Fabio Fabiani<sup>1</sup>

## SAFETY AND PROTECTION

- Patients at high risk of dislocation regardless of duration (ICU, pronation, history of previous dislocation)
- More than 5-6 weeks of catheter stay duration
- Patients at risk of MARSI or with skin problems (allergies, burns, hyperhidrosis)
- Home management problems

# CONCLUSIONS

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## Subcutaneously anchored securement for peripherally inserted central catheters: Immediate, early, and late complications

Fabrizio Brescia<sup>1</sup>, Mauro Pittiruti<sup>2</sup>, Laura Roveredo<sup>1</sup>, Chiara Zanier<sup>1</sup>, Antonietta Morabito<sup>1</sup>, Elisabetta Santarossa<sup>1</sup>, Valentina Da Ros<sup>3</sup>, Marcella Montico<sup>4</sup> and Fabio Fabiani<sup>1</sup>

## SAFETY AND PROTECTION

- Choice of a SAS of adequate size
- Subcutaneous positioning of the nitilon bars
- Adequate training before clinica use
- Use SAS and **glue** to simultaneously achieve adequate catheter safety and optimal exit site protection

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*Thank you for your attention*

