

WOCOVA
7th World Congress on Vascular Access



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Current options for VAD Securement

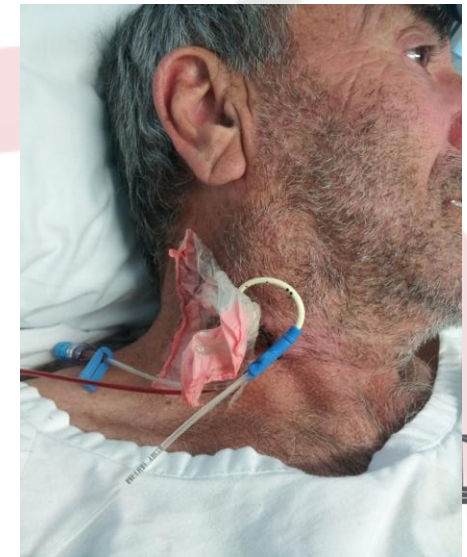
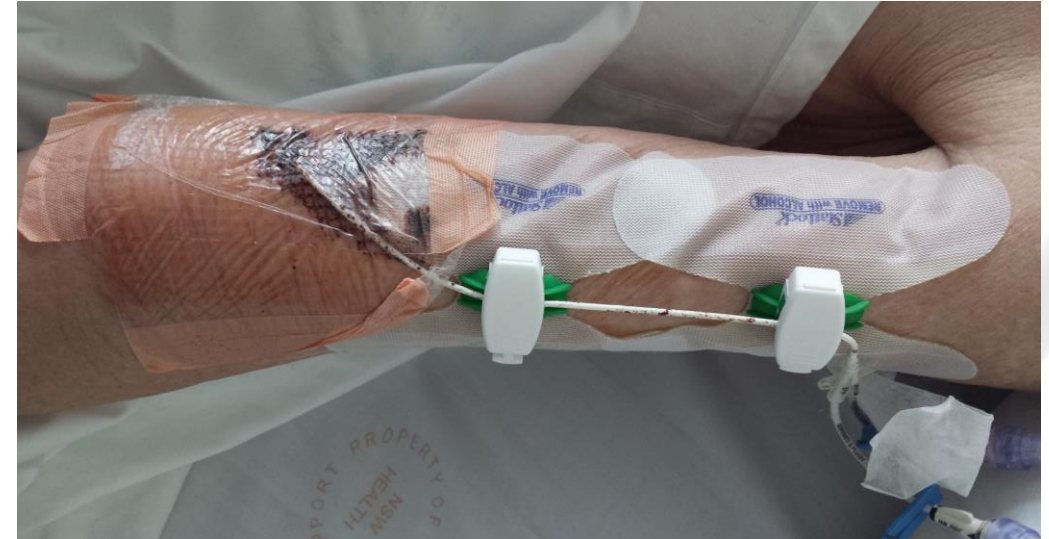


Disclosures:

- No conflicts of interest related to this presentation
- Have been engaged (and received honoraria) to deliver educational talks, webinars and consultancy in 2022 by:
 - 3M Australia
 - Teleflex Australia
 - ITL Australia
- Have been successful in competitive investigator initiated grants applications with Eloquest (USA) and BD (Asia Pacific) – funds payable to University and Health District

Current options for VAD Securement

- Appropriate securement of VADs crucial in device performance and longevity
- Number of catheter securement options available for both peripheral and central VADs
- Good securement can reduce:
 - catheter migration & malposition,
 - catheter dislodgment and infection
 - catheter occlusion / DVT



• Hill, S., & Moureau, N. L. (2019). Right securement, dressing, and management. In *Vessel health and preservation: The right approach for vascular access* (pp. 117-130). Springer, Cham.

• Ullman, A., Marsh, N., & Rickard, C. (2017). Securement for vascular access devices: looking to the future. *British Journal of Nursing*, 26(8), S24-S26.



Current options for VAD Securement

Dressing and Securement – what's the difference?

- Polyurethane dressings (transparent) allow for direct visualisation of insertion site - have an acrylic adhesive
- Prevent microbial entry and infection
- Permeable membrane allows moisture to evaporate
- Polyurethane superior to standard gauze except in high exudate / skin situations - limited evidence on infectious outcomes



**Dressings provide 'stability'
but not always securement**

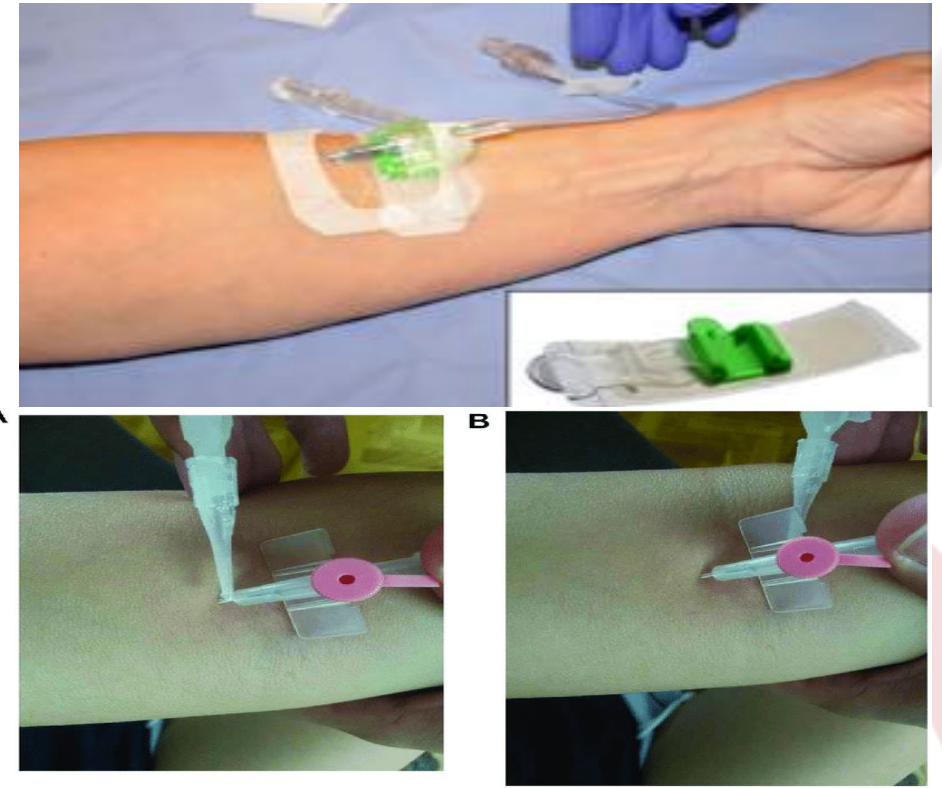
Current options for VAD Securement

- Securement options range from:
 - basic suture
 - adhesive sutureless securement
 - subcutaneously anchored security devices
 - cyanoacrylate glue
 - newer generation integrated securement dressings
- VADs can have combination of ‘multiple’ securement products
e.g. Subcutaneous fixation with sutureless securement)



Current options for VAD Securement

IMPORTANTLY – CATHETER EXIT SITE GOES HAND IN HAND WITH OPTIMAL SECUREMENT



Current options for PIVC Securement

Sutureless securement remains the mainstay for PIVCs

- Sutureless securement device (SSD): device that adheres to the skin and holds PIVC in place
- Integrated securement device (ISD): combines bordered polyurethane dressing with the fabric collar having built-in securement technology
- Tissue adhesive (TA): medical-grade cyanoacrylate glue - seals the insertion site and temporarily bond the catheter to the skin at the point of insertion



Current options for PIVC Securement

What does the evidence say?

- Two centre randomised trial
- 1807 patients allocated to intervention / control groups (1:1:1:1)
- - Tissue adhesive with polyurethane dressing
- - Bordered polyurethane dressing
- - Securement device with polyurethane dressing
- - Polyurethane dressing (control).



NEARLY 40% FAILURE ACROSS ALL GROUPS

• Rickard, C. M., Marsh, N., Webster, J., Runnegar, N., Larsen, E., McGrail, M. R., ... & Playford, E. G. (2018). Dressings and securements for the prevention of peripheral intravenous catheter failure in adults (SAVE): a pragmatic, randomised controlled, superiority trial. *The Lancet*, 392(10145), 419-430.

Current options for PIVC Securement

What does the evidence say?


- Single centre randomised trial by Bahl (2021)
- 350 patients (175 each group)
- Patients followed until PIVC failure or completion of therapy (up to 7 days)
- Failure rate was similar in both groups
- If lasted > 48hrs, glue group failed less - cost neutral after 48hrs

- Bahl, A., Gibson, S. M., Jankowski, D., & Chen, N. W. (2021). Short peripheral intravenous catheter securement with cyanoacrylate glue compared to conventional dressing: a randomized controlled trial. *The Journal of Vascular Access*, 11297298211024037.

Original research article

Short peripheral intravenous catheter securement with cyanoacrylate glue compared to conventional dressing: A randomized controlled trial

JVA | The Journal of Vascular Access

The Journal of Vascular Access
1-12
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Current options for PIVC Securement

What does the evidence say?

- Discussion paper by Pittiruti (2022) and colleagues on cyanoacrylate glue
- May be effective when used **in combination** with polyurethane dressings and securement devices (e.g. integrated securement dressings)
- Has haemostatic qualities and possible anti-bacterial effect but more evidence is required

Ten years of clinical experience with cyanoacrylate glue for venous access in a 1300-bed university hospital

Mauro Pittiruti, Maria Giuseppina Annetta, Bruno Marche, Vito D'Andrea and Giancarlo Scoppettuolo

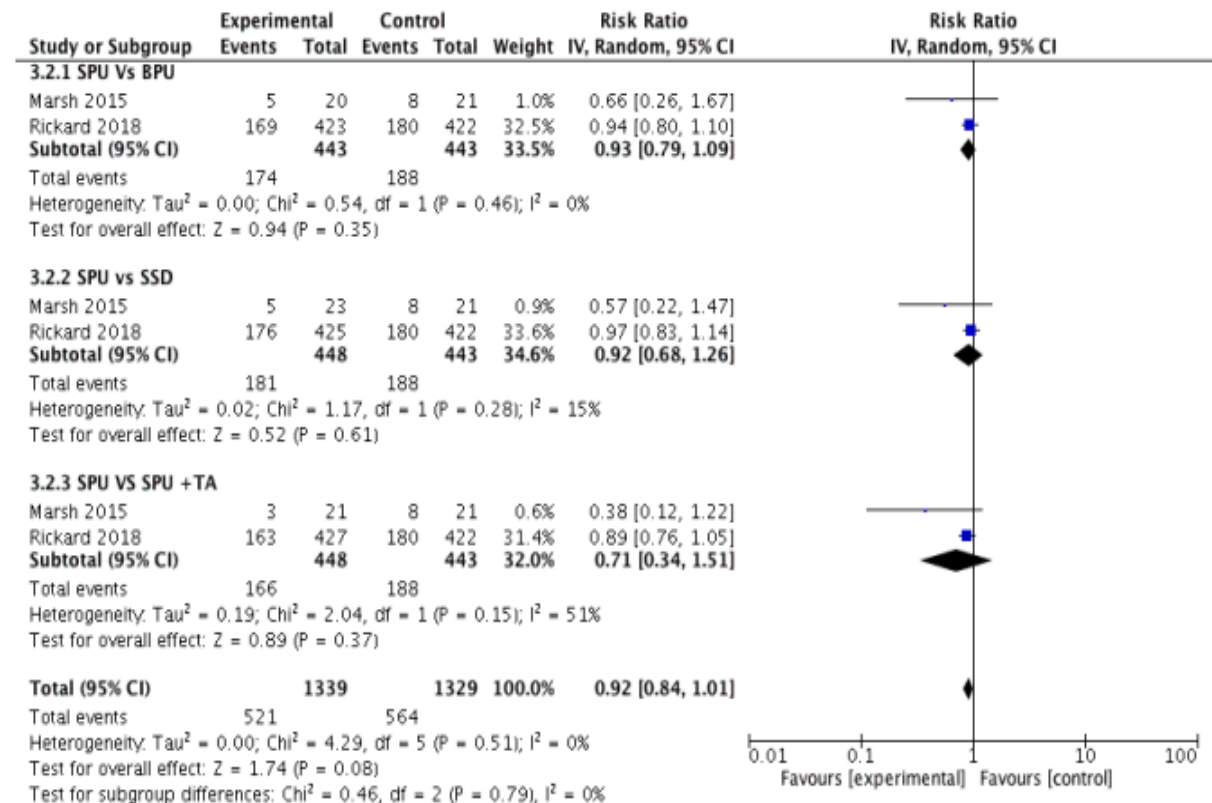


• Pittiruti, M., Annetta, M. G., Marche, B., D'Andrea, V., & Scoppettuolo, G. (2022). Ten years of clinical experience with cyanoacrylate glue for venous access in a 1300-bed university hospital. *Journal of the Association for Vascular Access*, 27(2), 40-46.

Current options for PIVC Securement

What does the evidence say?

- Meta analysis by Keogh et al (2019) of randomised trials on securement devices / techniques
 - SPU vs BPU
 - SPU vs SSD
 - SPU vs SPU with Glue
- There was no heterogeneity present across analyses



**No significant difference between groups
RR 0.92 (95% CI 0.84, 1.01)**

Current options for PIVC Securement

What does the evidence say?

- Integrative review on PIVC securement by with adhesive tapes by Corley et al (2022)

19 studies, 43,683 PIVCs

- **Use of nonsterile tape (over PIVC dressing) was associated with increased failure and complications**
- Sutureless securement could potentially reduce failure
- Over half the studies were deemed poor methodological quality

REVIEW

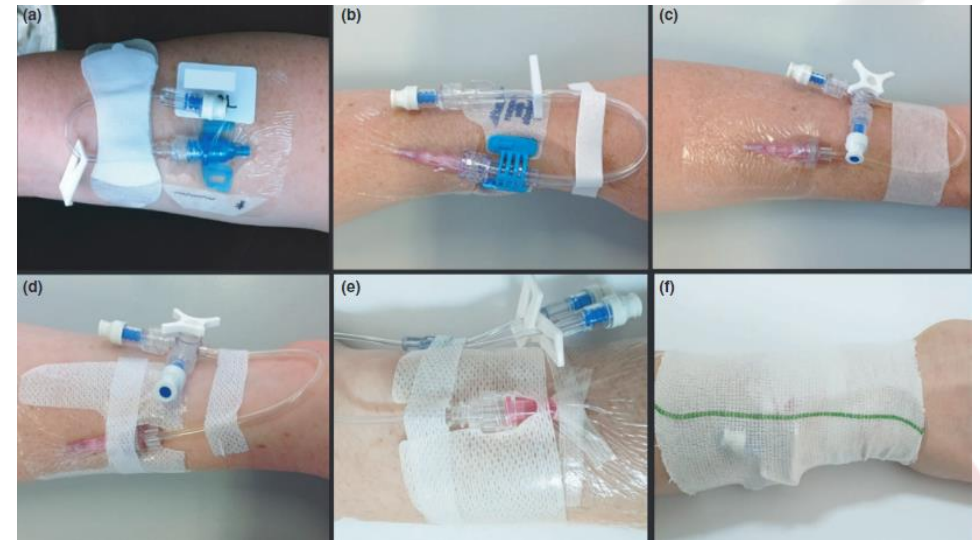
Journal of
Clinical Nursing WILEY

Peripheral intravenous catheter securement: An integrative review of contemporary literature around medical adhesive tapes and supplementary securement products

Amanda Corley RN, BN, MAdvPrac(Research), Research Fellow^{1,2,3} |

Nicole Marsh RN, PhD, MAdvPrac(Research), Professor^{1,2,3,4} |

Amanda J Ullman RN, PhD, Professor^{1,2,3,5} | Claire M Rickard RN, PhD, Professor^{1,2,3,4}



Current options for PIVC Securement

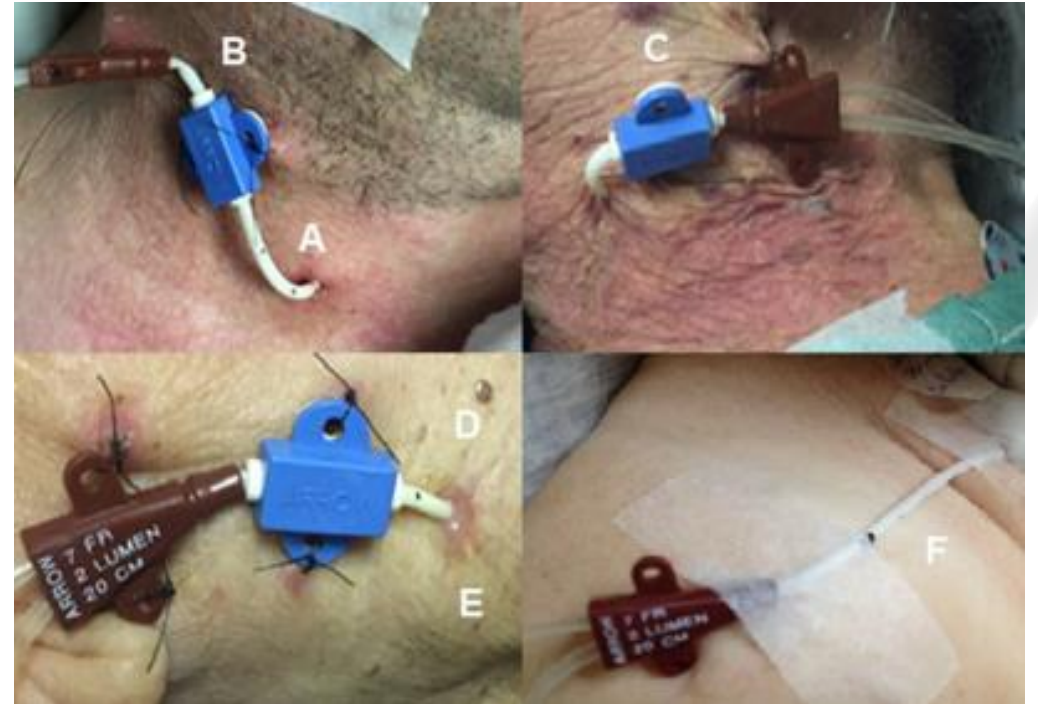
What does the evidence suggest about PIVC securement?

- Extra cost for added securement devices or glue may only have marginal effect on PIVC failure
- **Dressing and securement success is closely linked to anatomical placement of the PIVC**
- Promote optimal PIVC placement practices that will optimise securement efforts



Current options for CVAD Securement

- Sutures are still largely used by non VA specialists (particularly CICCs in critical care) – and not necessarily non braided
- Sutureless securement developed to replace need for suturing CVADs to reduce infectious complications
- Three main types of sutureless securement:
 - Standard sutureless securement with adhesive backing
 - Subcutaneous anchoring devices
 - Cyanoacrylate glue



Current options for CVAD Securement

What does the evidence say?

- Sutureless securement with adhesive backing (Stat lock / Grip lock) has been the primary form of CVAD securement
- Usually comes as part of PICC and CICC insertion packs
- **CVAD dislodgement rates with adhesive sutureless securement reported between 10 – 20%**



- Chan, R. J., Northfield, S., Larsen, E., Mihala, G., Ullman, A., Hancock, P., ... & Rickard, C. M. (2017). Central venous Access device SeCurement And Dressing Effectiveness for peripherally inserted central catheters in adult acute hospital patients (CASCADE): a pilot randomised controlled trial. *Trials*, 18(1), 1-13.
- Mitchell, M. L., Ullman, A. J., Takashima, M., Davis, C., Mihala, G., Powell, M., ... & Rickard, C. M. (2020). Central venous access device Securement and dressing effectiveness: The CASCADE pilot randomised controlled trial in the adult intensive care. *Australian Critical Care*, 33(5), 441-451.

Current options for CVAD Securement

What does the evidence say?

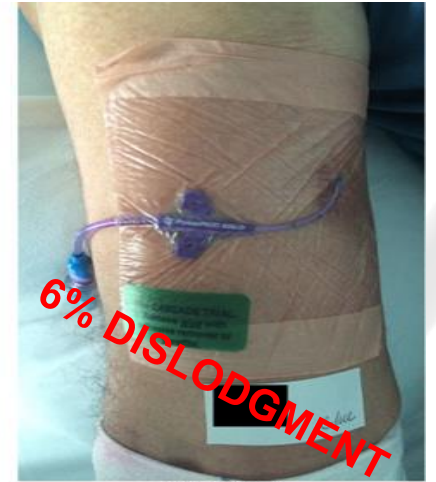
- Pilot RCT assessing PICC securement (124 patients)

Assessed:

- Standard dressing with sutureless securement
 - Polyurethane with absorbent lattice pad dressing
 - Combination securement-dressing
 - Tissue adhesive with standard dressing
- **Pilot acceptable for larger study**



SPU+SSD+CHG



TA+SPU



CSD+CHG



PAL+CHG

Current options for CVAD Securement

What does the evidence say?

- Recently completed randomised 2x2 factorial trial by Rickard et al. (2022)
1045 patients

Assessed:

	Chlorhexidine Patch (CHG)	No Chlorhexidine Patch
Integrated Securement Device	CHG+ISD	No CHG+ISD
Engineered Securement Device	CHG+ESD	No CHG+ESD

Outcomes of interest:

- Rate of CLABSI
- All cause failure
- Failure by type (MARSI, dislodgement etc.)



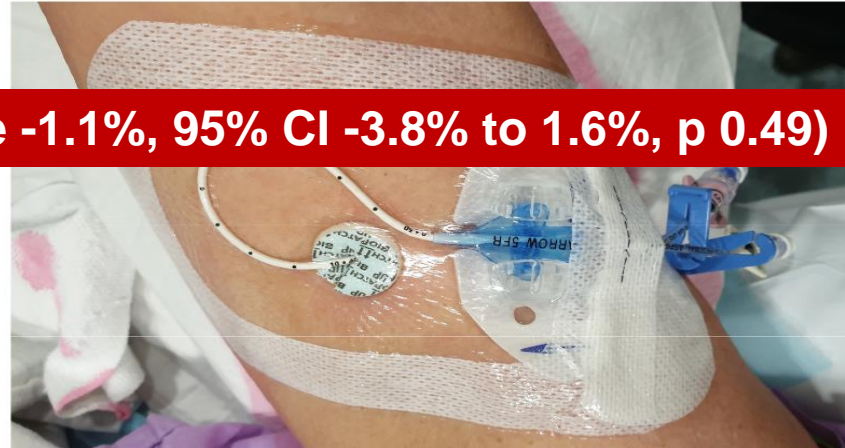
Current options for CVAD Securement

What does the evidence say?

RESULTS:



No difference in CLAB rates (Difference -1.1%, 95% CI -3.8% to 1.6%, p 0.49)



No difference in FAILURE rates (Difference 0.1%, 95% CI -4.9% to 5.1%, p 1.0)



No difference in DISLODGE MENT rates (Difference 1.8%, 95% CI 0.7% to 4.4%, p 0.19)



Current options for CVAD Securement

What does the evidence say?

- Cyanoacrylate glue increases pull out force x 4 (in vitro test)
- **Glue used exclusively does not reduce risk dislodgement but may have haemostatic and antibacterial effects**
- Regular use of glue in conjunction with sutureless securement / dressings can reduce catheter dislodgement
- Excellent strategy for tunnelled lines (puncture site and exit site)

A Revolutionary, Proven Solution to Vascular Access Concerns: A Review of the Advantageous Properties and Benefits of Catheter Securement Cyanoacrylate Adhesives

Sheng Zhang, PhD • Bethany S. Lingle, BS • Shannon Phelps, BS

Ten years of clinical experience with cyanoacrylate glue for venous access in a 1300-bed university hospital

Mauro Pittiruti, Maria Giuseppina Annetta, Bruno Marche, Vito D'Andrea and Giancarlo Scoppettuolo



- Pittiruti, M., Annetta, M. G., Marche, B., D'Andrea, V., & Scoppettuolo, G. (2022). Ten years of clinical experience with cyanoacrylate glue for venous access in a 1300-bed university hospital. *Journal of the Association for Vascular Access*, 27(2), 40-46.
- Ralph Webber, J. L., & Maningo-Salinas, M. J. (2020). "Sticking It to Them"—Reducing Migration of Peripherally Inserted Central Catheters. *Journal of the Association for Vascular Access*, 25(1), 10-15.
- Zhang, S., Lingle, B. S., & Phelps, S. (2022). A Revolutionary, Proven Solution to Vascular Access Concerns: A Review of the Advantageous Properties and Benefits of Catheter Securement Cyanoacrylate Adhesives. *Journal of Infusion Nursing*, 45(3), 154-164.

Current options for CVAD Securement

What does the evidence say?

- Small number of studies address utility of subcutaneous anchoring (SAS) (SecurAcath™)
- One of the most important innovations in recent years for sutureless CVAD securement

GAVeCeLT - WoCoVa 2020 recommendations:

- SAS is effective against accidental dislodgement (adults and children)
- caution needed as many studies to date are observational in nature
- No strong evidence SAS can reduce CRDVT



Current options for CVAD Securement

What does the evidence say?

THE JOURNAL OF MATERNAL-FETAL & NEONATAL MEDICINE
<https://doi.org/10.1080/14767058.2021.1922377>



SHORT REPORT



Securement of central venous catheters by subcutaneously anchored suturless devices in neonates

Vito D'Andrea^a, Giovanni Barone^b, Lucilla Pezza^a, Giorgia Prontera^a, Giovanni Vento^a and Mauro Pittiruti^c

N=72 PICCs

- No dislodgement reported

Original research article

Safety and effectiveness of subcutaneously anchored securement for tunneled central catheters in oncological pediatric patients: A retrospective study

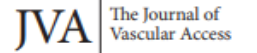
N=311 CVADs

- Dislodgement 2.6%
- CLABSI 13.5%
- Discomfort with SAS 1.3%



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Original Research Article



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

Fabrizio Brescia¹, Mauro Pittiruti², Laura Roveredo¹, Chiara Zanier¹, Antonietta Morabito¹, Elisabetta Santarossa¹, Valentina Da Ros³, Marcella Montico⁴ and Fabio Fabiani¹

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N=639 PICCs

- Skin ecchymosis 3.8% (early complication)
- Symptomatic DVT 1.9%
- Pain / ulceration at sight 2.6%
- Dislodgement 1.1%



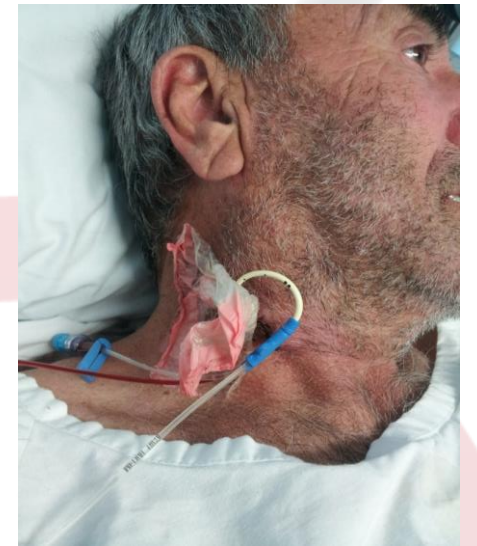
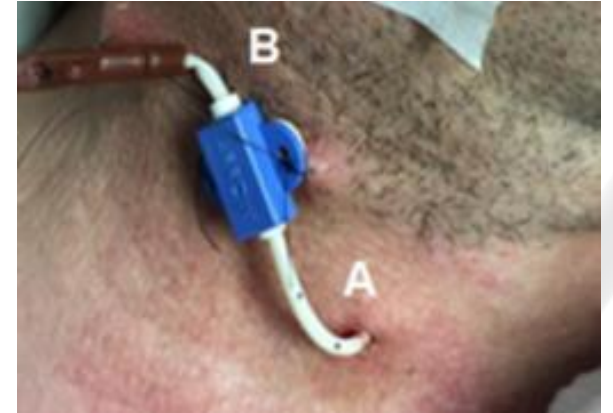
Current options for CVAD Securement

What does the evidence say?

- Sutures are still prevalent for CVAD securement but from non VA specialists

We need to let our colleagues know:

- Sutures should be replaced in 7-10 days – were never intended / labelled for external device fixation
- Sutures lose tensile strength over time (accelerated by moisture / alcohol washing etc.)
- Sutures require skin punctures that break integrity of skin
- Braided sutures provide medium for micro organism proliferation



• Ethicon Products World Wide. Wound closure manual. Ethicon Inc. a Johnson & Johnson Company. 2021. https://usermanual.wiki/Document/EthiconWoundClosureManual_101702.454226757/html. Accessed March 21, 2022.

• Bell, J. A., Hawes, M., Diloreto, E., & Gibson, S. M. (2022). Systematic Review of the Safety and Efficacy of Central Vascular Access Device Securement. Journal of the Association for Vascular Access, 27(3), 15-35.

Current options for CVAD Securement

What dose the evidence say?

- Recent integrative review (2022) by Bell et al. on safety and efficacy of CVAD securement
- Significant heterogeneity found in studies and results – no comparisons were made
- Observed rates of migration and dislodgement were reported

ORIGINAL ARTICLE CE

Systematic Review of the Safety and Efficacy of Central Vascular Access Device Securement

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 Vascular Access Consulting LLC, Henderson, KY

Table 3. Primary Endpoints. Median Incidence and Interquartile Range of Migration and Dislodgement (M&D) and Central Line-Associated Bloodstream Infections (CLABSIs) for 5 Different Securement Types

Securement	n	M&D	CLABSI
ASD	23	9.69 (12.8)	1.13 (2.86)
ISD	4	4.17 (8.67)	2.33 (5.57)
SASS	13	1.76 (3.47) ^a	1.96 (4.25)
SBS	22	6.77 (18.4)	0.78 (5.96) ^a
TA	5	5.56 (12.5)	0 (0.694)

ASD = adhesive securement device; ISD = integrated securement device; SASS = subcutaneous anchored securement system; SBS = suture-based securement; TA = tissue adhesive.

^aMinimum nonzero values.

Current options CVAD Securement

What does the evidence suggest about CVAD securement?

- No strong evidence one single product can reduce catheter dislodgement
- Subcutaneous anchoring is a promising solution but better evidence required
- **Dressing and securement success is closely linked to anatomical placement of the CVAD**
- A combination of multiple securement products may be the best current solution



Thank You

QUESTIONS?

