“The consequences of failure include the morbidity and mortality associated with the cause of the complication interruption of medical treatment and the insertion of replacement CVADs, involving the additional risk of procedural complications. Many CVAD complications are PREVENTABLE.” Ullman et al.
Catheter securement has been as much a challenge as catheter placement since venous and arterial access began.

A “one size fits all approach to CVAD securement is inappropriate and likely to be ineffective.” Broadhurst, Moureau, Ullman 2016

2016 Ullman et al. “25% of pediatric CVAD’s fail prior to treatment being complete.”
Dislodgement rates with intravenous catheters are reported at 1.8%-24% events per year resulting in failed access, interrupted treatment and greater resource consumption with catheter replacement.

Out of 1561 respondents 96.5% were from PIVC’s, with the top three contributing factors: 90% confused, 74% patient removal, IV catheter tape or securement loose 65%,

95% of respondents consider IV dislodgement a safety risk to patients.

Conclusion: Global inconsistencies exist with use, application, and management of catheter securement and dressings for IV catheters.

Catheter Stabilization
We must agree that all patients are unique from their mental status to their skin integrity.

**Ideal Securement**

- Provide Hold Strength
- Block Bacteria from Entering the Wound
- Have Antimicrobial Properties
- Assist with Hemostasis
- Be Comfortable for patients
- Be Easy for Staff to use
- Be Cost Effective

Frey and Schears in 2001 state, “Knowledge of reported rates of PICC dislodgment in children... is of the upmost importance when caring for children with PICC’s.”
“A correct preliminary ultrasound evaluation of the patient’s veins and the choice of the suitable vein are the fundamental requirements to guarantee a **stable** and long-lasting venous access.” (Brescia, et al.)
Non-Invasive Securement Methods

• 1. Convert to ORAL medication

• 2. Direct 1:1 Observation

• 3. Virtual Patient Observation

• 4. Patient and Family Education
Stabilization Devices

1. Dressing Securement
2. Cutaneous Adhesive Securement
3. Joint Stabilization Boards
4. Sutures
5. Cyanoacrylate
6. Subcutaneous Securement
7. Catheter Incorporated: Cuffed
8. Wing Stabilization
9. Tunneling to Alternative Exit Site
10. Incorporated Stabilization and Extension Tubing
COVID has decreased supplies resulting in kits without stabilization devices.

Suturing is thought to promote bacterial colonization at the catheter site. It is hypothesized that placing cyanoacrylate over the suture site will reduce this risk.
Sutureless Securement Devices: Transparent Membrane Dressing Securement

Sutureless securement was brought in to eliminate risk of sharp injury from suturing as well as bacterial colonization from suturing.
Built In Stabilization

accepted but unacceptable: peripheral iv catheter failure

Table 2

The 5 Modes of Peripheral IV Catheter Failure: Prospective Randomized Controlled Studies 1990-2014

<table>
<thead>
<tr>
<th>Mode of Peripheral IV Catheter Failure</th>
<th>Range</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catheter-related phlebitis</td>
<td>0.1%-63.3%</td>
<td>15.4%</td>
</tr>
<tr>
<td>Catheter infiltration</td>
<td>15.7%-33.8%</td>
<td>23.9%</td>
</tr>
<tr>
<td>Catheter occlusion/mechanical failure</td>
<td>2.5%-32.7%</td>
<td>18.8%</td>
</tr>
<tr>
<td>Catheter dislodgment</td>
<td>3.7%-9.9%</td>
<td>6.9%</td>
</tr>
<tr>
<td>Catheter-related infection</td>
<td>0.0%-0.44%</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

Ultrasound-guided placement of peripherally inserted intravenous catheters increase catheter dwell time in children

James Thomas Cottenell 1, Todd Chang 2, Jennifer Baird 3, Joanna Barreras 1, Marsh A Chudnoff 2

Finally, “Meaningful change will require that the concept of the peripheral IV catheter as an expendable and replaceable tool be discarded.

Strategy: attaching extension tubing to the catheter hub, so that the interaction point is remote from the actual catheter and its insertion site.

2011 INS standards reads, “the use of catheter stabilization device should be considered the preferred alternative to tape or sutures when feasible.

Effectiveness of transparent film dressing for peripheral intravenous catheter

Selma Atay 3, Fatma Yilmaz Kurt 3

Securement | Rationale
---|---
Entry Site Integrity | Open Wound
Exit Site Location | Ultrasound
Cutaneous Securement | Stabilization
Cyanoacrylate | Seal Wound/Stabilization
Transparent Film Dressing | Protect Site/Stabilization
Cyanoacrylate

Tissue adhesive as an alternative to sutures for securing central venous catheters

Successful use of tissue adhesive for epidural catheter and thoracic epidural securement.

Cyanoacrylate glue prevents early bleeding of the exit site after CVC or PICC placement

PICC, Dialysis and CVC lines to reduce site bleeding, entrance of bacteria and increasing catheter stability.

A pilot trial of bordered polyurethane dressings, tissue adhesive and sutureless devices compared with standard polyurethane dressings for securing short-term arterial catheters

Central venous Access device SeCurement And Dressing Effectiveness (CASCADE) in paediatrics: protocol for pilot randomised controlled trials

Further benefits of cyanoacrylate glue for central venous catheterisation

Reduced site bleeding from 40% to 0%, eliminating early dressing changes.
Built in Central Catheter Securement

- Ullman et al. concludes, “Careful consideration should be given by interdisciplinary clinicians when choosing CVAD securement to ensure it is the most appropriate device for the individual needs of their patient.”

Cuff

Sutures
Cyanoacrylate, Cutaneous Stabilization Bordered dressings

"Cuff-stitch" to prevent inadvertent dislodgement of central venous catheters

R Babu 1, R D Spicer

Improvement of catheter-related outcomes after application of tunneled cuffed hemodialysis catheter insertion without fluoroscopy

Seok Hui Kang 1, Jun Young Do 1

Compared replacing non tunneled temporary hemodialysis catheters with tunneled hemodialysis catheters at the bedside with improved outcomes and overall nurse satisfaction.
Avoid in non-cooperative patients and patients with cognitive disorders who have a very high risk of involuntary removal of the VAD – seek out alternate exit site location or totally implantable.

Best results (zero dislodgments) from trained operatives.
This is the only securement that eliminates catheter migration and pistoning during a dressing change and that is where the true benefit exists in this device.
The ideal securement of a long term VAD is the application of SAS, sealing the insertion wound with cyanoacrylate, and reinforcing pull force with cutaneous adhesive securement to the catheter hub. Future studies should examine cutaneous securement of the catheter hub compared to securing the hub with a cyanoacrylate.

Cost effective:
1 device for length of therapy
Eliminating MARSI

Subcutaneous Securement


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

Fulvio Pinelli 1, Mauro Pittiruti 2, Ton Van Boxtel 3, Giovanni Barone 4, Roberto Biffi 5, Giuseppe Capozzoli 6, Alessandro Crocchi 7, Stefano Elia 8, Daniele Elisei 9, Adam Fabiani 10, Cristina Garrino 11, Ugo Graziano 12, Luca Montagnani 13, Alessio Pini Prato 14, Giancarlo Scoppettuolo 15, Nicola Zadra 16, Clelia Zanaboni 17, Pietro Zeria 18, Evangelos Konstantinou 19, Matt Jones 20, Hervé Rosay 21, Liz Simcock 22, Marguerite Stas 23, Gilda Pepe 24
Alternate Exit Site Locations

Prevention of epidural catheter migration: A comparative evaluation of two tunneling techniques
Sujeet Gautam ¹, Anil Agarwal ², Pravin Kumar Das ³, Sandeep Khuba ⁴, Sanjay Kumar ⁵

Complications and cost associated with parenteral nutrition delivered to hospitalized patients through either subclavian or peripherally-inserted central catheters
C T Cowl ⁶, J V Weinstock, A Al-Jurf, K Ephgrave, J A Murray, K Dillon

Alternative exit sites for central venous access: Back tunneling to the scapular region and distal tunneling to the patellar region
Matthew D Ostroff ¹, Mauro Pittiruti ²
Native Access Via Arteriovenous Fistula

Long Term / Permanent Securement

Port Placement
Subcutaneous Securement does not attach to the hub of the catheter resulting in pull force narrowing the catheter resulting in it sliding through the device.

Sutured 2nd Site to Face but catheter not inside the securement device

Eroded Portacath

All Securement Can Fail
COVID and Catheter Securement

Securing Catheters for patients in the PRONE position.

Securing Catheters for Infusions Running from OUTSIDE the rooms

Securing Central Access for Central Medication Administration and Dialysis

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

Mauro Pittiruti, Fulvio Pinelli, and on behalf of the GAVeCeLT Working Group for Vascular Access in COVID-19

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Thank You For Your Attention
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