Clinical evidence supporting the use of SecurePortIV® Catheter Securement Adhesive

H.B. Fuller Medical Adhesive Technologies, LLC

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Catheter Securement Adhesive
Highly Purified Medical Cyanoacrylate

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Peripheral Vascular Access Studies

van Rens M, Spencer TR, Hugill K, Francia ALV, van Loon FHJ, Bayoumi MAA. **Octyl-butyl-cyanoacrylate glue for securement of peripheral intravenous catheters: A retrospective, observational study in the neonatal population.** The Journal of Vascular Access. J Vasc Access 2023 Feb 15

- This observational study of 8,330 neonatal peripheral intravenous catheter (PIVC) insertions in neonates demonstrated significant improvement in outcomes when SecurePortIV® was added to the current standard of care. Findings include 77% reduction in phlebitis, 32% increase in elective removal vs non-elective removal and 20% increase in average dwell time (truncated by the increase in elective removals). The glue was safe and effective in the neonate patient population.

Bahl A, Gibson SM, Jankowski D, Chen N. **Short peripheral intravenous catheter securement with cyanoacrylate glue compared to conventional dressing: A randomized controlled trial.** J Vasc Access. 2021 Jun 11

- Results demonstrate a 43% reduced risk of failure after 48 hours when Tissue Adhesive was applied to the IV in the emergency department site prior to dressing application where multiple complications were reduced including dislodgement, site leaking and phlebitis.
- Further analysis demonstrated the intervention was cost neutral when considering the overall costs associated vascular access.

Pittiruti M, Van Boxtel T, Scoppettuolo G, et al. **European recommendations on the proper indication and use of peripheral venous access devices (the ERPIUP consensus): A WoCoVA project.** J Vasc Access. 2021 Jun 4

- Since several innovations have recently changed the criteria of choice and management of peripheral venous access (new devices, new techniques of insertion, new recommendations for maintenance), the WoCoVA Foundation (WoCoVA = World Conference on Vascular Access) has developed an international Consensus that include use of tissue adhesive for all vascular access care and maintenance.

Rickard C, Marsh N, Webster J, et al. **Dressings and securements for the prevention of peripheral intravenous catheter failure in adults (SAVE): a pragmatic, randomised controlled, superiority trial.** Lancet. 2018 Aug 4;392(10145):419-430

- Results demonstrate an 8% to 9% absolute failure rate reduction with the use of tissue adhesive vs. the other PIVC securement technologies studied. Stated differently, vs. the Tissue Adhesive arm, the failure rates associated other dressing options were 31% to 35% higher.
- Results demonstrate a 3% to 6% absolute occlusion rate reduction with the use of tissue adhesive vs. the other PIVC securement technologies studied. Stated differently, vs. the Tissue Adhesive arm, the occlusion rates associated other dressing options were 19% to 45% higher.
- Results demonstrate a reduction in dislodgement of 0.6 to 1.1 dislodgements per 100-catheter-days. Stated differently, vs. the Tissue Adhesive arm, the dislodgement rates per 100-catheter-days associated other dressing options were 24% to 46% higher.
- Results demonstrate that the total costs of the trial interventions did not differ significantly between groups.

Bugden S, Shean K, Scott M, et al. **Skin Glue Reduces the Failure Rate of Emergency Department-Inserted Peripheral Intravenous Catheters: A Randomized Controlled Trial.** Ann Emerg Med. 2016 Aug;68(2):196-201

- Results demonstrate a 37% overall reduction in PIVC failure and a 50% reduction in PIV dislodgement with the use of tissue adhesive for IV catheter securement.

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Marsh N, Webster J, Flynn J, et al. **Securement methods for peripheral venous catheters to prevent failure: a randomised controlled pilot trial.** J Vasc Access. 2015;16:237-244

- Results suggest lower peripheral venous catheter failure rates associated with the use of tissue adhesive: 63.2% lower vs standard polyurethane dressing, 46.5% lower vs bordered polyurethane dressing and 36.4% lower vs sutureless securement device.

Reynolds H, Taraporewalla K, Tower M, et al. **Novel technologies can provide effective dressing and securement for peripheral arterial catheters: a pilot randomised controlled trial in the operating theatre and the intensive care unit.** Aust Crit Care. 2015 Aug;28(3):140-8

- Results suggest lower arterial catheter failure rates associated with the use of tissues adhesive: 68.5% lower vs standard polyurethane dressing, 53.3% lower vs bordered polyurethane dressing and 61.3% lower vs sutureless securement device.

Edwards M, Rickard CM, Rapchuk I, et al. **A pilot trial of bordered polyurethane dressings, tissue adhesive and sutureless devices compared with standard polyurethane dressings for securing short-term arterial catheters.** Crit Care Resusc. 2014;16:175-183

- Results suggest that the use of tissue adhesive is safe and feasible vs other methods for short-term arterial catheter securement. The authors further recommended that the use of tissue adhesives is worthy of examination in larger trials.

Imbriaco G, Monesi A, Spencer TR. **Preventing radial arterial catheter failure in critical care - factoring updated clinical strategies and techniques**. *Anaesth Crit Care Pain Med*. Apr 28 2022

- Radial artery catheterization (RAC) is a frequently performed procedure for critically ill patients. The correct function of arterial catheters is essential to provide accurate and continuous hemodynamic monitoring, facilitating intermittent blood sampling and helps optimize the workload for critical care nurses and physicians.
- Accidental catheter removal and dislodgement may interrupt continuous hemodynamic monitoring and
- represent a serious bleeding threat for patients.
- The traditional approach of suturing is now considered an outdated practice, with the availability of newer and safer devices. Sutures are no longer considered an appropriate securement method and is associated with increased site-related bleeding, the need for repeated dressing changes, potential for needlestick injuries, facilitates the growth of biofilm, an increased risk of catheter associated bloodstream infection (CABSI) and lastly, should be best avoided in accordance with current standards of practice.
- RACs secured with Cyanoacrylate Glue (CG) showed stronger resistance to pull out force and CG with a primary dressing demonstrated superior efficacy in avoiding dislodgement, with catheter failure rates of 6.3-11%, lower than other methods. Clinicians should evaluate the use of various securement options, considering ASDs and CG in addition to the primary dressing for enhanced catheter stabilization.

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Central Vascular Access Studies

2022 National Teaching Institute Evidence-Based Solutions Abstracts. *Crit Care Nurse*. Apr 1 2022;42(2):e10-e36.

- Rodriguez, H. and Nuila, C. share outcomes at the Association for Critical Care Nurses (AACN) on their quality improvement CLABSI reduction using Tissue Adhesive in the intensive care unit.
- 89% CLABSI reduction achieved
- >50% reduction in dressing-change frequency
- NO patients were reported to have skin-related reactions

van Rens M, Abdelghafar N, Nimeri N, Spencer T, et. al. **Cyanoacrylate Securement in Neonatal PICC Use: A 4-Year Observational Study Adv Neonatal Care.** *Adv Neonatal Care. 2022 Jun 1;22(3):270-279*

- Results demonstrate a significant reduction in both CLABSI risk (50% to 65%) and overall therapy failure (44% to 58%) in gross analysis and when adjusted for catheter type and patient characteristics.
- Deeper review of the analysis demonstrated benefits associated with TA use including reduced risk of extravasation and infiltration, maintenance-related complications, phlebitis, suspected sepsis, and death.

Pearse I, Corley A, Qu Y, Fraser J. **Tissue adhesives for bacterial inhibition in extracorporeal membrane oxygenation cannulae.** *Intensive Care Med Exp*. May 10 2021;9(1):25

- One of the most serious complications of extracorporeal membrane oxygenation (ECMO) therapy is ECMO cannulae infection, which can occur at quadruple the rate of central venous catheter infections, and significantly impact morbidity and paediatric mortality.
- The objective of this in vitro observational study was to assess antimicrobial properties of cyanoacrylate tissue adhesive (TA) formulations for bacterial inhibition at peripheral ECMO cannulae insertion sites.
- TA appears to inhibit bacterial growth and migration of S. epidermidis.
- Application of TA to cannulae insertion sites may therefore be a potential bedside strategy for infection prevention in ECMO cannulae

Pearse I, Corley A, Bartnikowski N, Fraser JF. **In vitro testing of cyanoacrylate tissue adhesives and sutures for extracorporeal membrane oxygenation cannula securement.** *Intensive Care Med Exp*. Jan 4 2021;9(1):5

- Growing evidence suggests tissue adhesive (TA) may be a practical and safe method to secure vascular access devices, but little evidence exists pertaining to securement of ECMO cannulae.
- The aim of this study was to determine the safety and efficacy of cyanoacrylate for use in peripherally inserted ECMO cannula securement and compare TA securement to 'standard' securement methods.
- This in vitro project assessed: (1) the tensile strength and flexibility of TA formulations compared to 'standard' ECMO cannula securement using a porcine skin model, and (2) the chemical resistance of the polyurethane ECMO cannulae to TA.
- Tissue adhesive securement may provide comparable securement strength to a single polypropylene drain stitch, and, when used as an adjunct securement method, may minimise the risks associated with suture securement. However, further clinical research is still needed in this area.

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D'Andrea V, Pezza L, Barone G, Prontera G, Pittiruti M, Vento G. **Use of cyanoacrylate glue for the sutureless securement of epicutaneo-caval catheters in neonates**. J Vasc Access. Apr 8 2021

- Epicutaneo-caval catheters (ECC) are pivotal for drug and fluid infusion in neonates. Given the intrinsic importance of the catheter for the patients' health and the need to avoid stressful and painful procedures on premature or critically ill newborns with fragile and poor vein asset, it is clearly necessary an accurate bundle for ECC insertion and management to avoid complications that may lead to non-elective ECC removal.
- Cyanoacrylate Glue added to usual securement devices is effective in reducing ECC accidental dislodgment. Moreover, it is easy and safe to apply and remove, limits bleeding and oozing at the puncture site, and may also be an effective antimicrobial mechanical barrier.

Ostroff M, Zauk A, Chowdhury S, Moureau N, & Mobley C. **A retrospective analysis of the clinical effectiveness of subcutaneously tunneled femoral vein cannulations at the bedside: A low risk central venous access approach in the neonatal intensive care unit** J Vasc Access 2020 Nov 5: 1-9

- The benefits of subcutaneously tunneled femoral inserted central catheters in the neonatal intensive care unit (NICU) population are reviewed. The authors conclude "Preserving vasculature and reducing device related complications is the main responsibility of the vascular access specialist. Contributing factors to the entire cohort completing the prescribed therapy with one catheter include: assessment through RaFeVA, proper catheter to vessel ratio, creating the ideal exit site through subcutaneous tunneling, proper tip positioning just distal to the junction of the inferior vena cava and right atrium, a continuous infusion, **proper securement with a cyanoacrylate skin glue**, meticulous monitoring, and care and maintenance by the registered nursing staff, and removal when central access is no longer warranted."

Webber JLR, Maningo-Salinas MJ. **"Sticking It to Them"—Reducing Migration of Peripherally Inserted Central Catheters.** J Vascular Access. 2020 Spring;25(1):10-15

- Results demonstrate a PICC migration rate reduction from 19.35% to 0% with continued use over the next 5 quarters having a 1.4% migration rate representing a 93% sustained migration reduction in 411 patients. During the study, an incidental observation was recognized where the intervention group demonstrated no CLABSI's for 5 consecutive quarters vs the non-intervention group range of 0-5 CLABSI per quarter where the intervention group added SecurPortIV tissue adhesive and eliminated the use of a chlorhexidine disc and an engineered securement device.

Biasucci DG, Pittiruti M, Taddei A, et. al. **Targeting Zero Catheter-related Bloodstream Infections in Pediatric Intensive Care Unit: A Retrospective Matched Case-Control Study.** J Vasc Access. 2018 Mar;19(2):119-124

- Results demonstrate a CVC CR-BSI rate reduction from 15/1000 catheter days to 1.5/1000 catheter days (a 90% reduction) and a mean dwell time of 2.2 days longer with the implementation of a new insertion, maintenance, and education bundle that included the use of cyanoacrylate tissue adhesive.
- Author comments: "*sealing the exit site… reduces risk of extraluminal contamination… and reduces bleeding at puncture site and prevents the "in and out" motion may reduce local damage to the endothelium and reduce risk of thrombosis.*"

Kleidon TM, Ullman AJ, Gibson V, et al. **A Pilot Randomized Controlled Trial of Novel Dressing and Securement Techniques in 101 Pediatric Patients**. J Vasc Interv Radiol. 2017 Sep 18

- Results demonstrate that the use of tissue adhesive reduced dressing changes per patient by 50% vs sutureless securement device (SSD) and integrated securement dressing (ISD) primarily by reducing dressing changes due to bleeding and oozing: 80.5% reduction/catheter day vs SSD + bordered transparent film dressing (BPU) and 71.8% reduction/catheter day vs ISD. The average time to first dressing change associated with the use of tissue adhesive was 2 days longer vs SSD and 3 days longer vs ISD.

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Ullman AJ, Kleidon T, Gibson V, et al. **Innovative dressing and securement of tunneled central venous access devices in pediatrics: a pilot randomized controlled trial.** BMC Cancer (2017) 17:595

- Results demonstrate that the use of tissue adhesive reduced total dressing changes per catheter day by 57.4% vs BPU + Suture, 45.2% vs ISD + Suture and 62.2% vs BPU + Suture + SSD.

Rickard CM, Edwards M, Spooner AJ, et al. **A 4-arm randomized controlled pilot trial of innovative solutions for jugular central venous access device securement in 221 cardiac surgical patients.** J Crit Care. 2016 Dec;36:35-42

- Results suggest that the additional use of tissue adhesive for jugular catheter securement may reduce catheter dislodgement and increase catheter dwell times.

Scoppettuolo G, Dolcetti L, Emoli A, et al. **Further benefits of cyanoacrylate glue for central venous catheterization.** Anaesthesia 2015, 70, 750–763

- The application of tissue adhesive at the PICC insertion site reduced site bleeding from 40% to 0%.

Scoppettuolo G, Annetta MG, Marano C, et al. **Cyanoacrylate glue prevents early bleeding of the exit site after CVC or PICC placement.** Critical Care 2013, 17(Suppl 2):P174

- Discusses the use of tissue adhesive at the insertion site of PICC, dialysis and CVC lines to reduce site bleeding, reduce entrance of bacteria into the site and increase stability of the catheter.

Wilkinson JN, Sheikh N, Jayamaha J. **Tissue adhesive as an alternative to sutures for securing central venous catheters.** Anaesthesia. 2007;62:969-970

- Discusses the successful use of tissue adhesive for CVC securement. Also mentions successful use or tissue adhesive for epidural catheter and thoracic epidural securement.

Martin JG, Hollenbeck ST, Janas G, et al. **Randomized Controlled Trial of Octyl Cyanoacrylate Skin Adhesive versus Subcuticular Suture for Skin Closure after Implantable Venous Port Placement.** Journal of Vascular and Interventional Radiology, 2017 Jan;28(1):111-116

- Concludes that adhesive is equivalent to suture but with significantly less closure time.

D'Andrea, V., Prontera, G., Pinna, G., Cota, F., Fattore, S., Costa, S., Migliorato, M., Barone, G., Pittiruti, M., & Vento, G. (2023). **Securement of Umbilical Venous Catheter Using Cyanoacrylate Glue: A Randomized Controlled Trial.** J Pediatr.

- Catheter dislodgement and infection are frequent complications of umbilical catheters. This study aims to determine the efficacy of cyanoacrylate tissue adhesive in reducing early failure or catheter malposition.
- A single center, randomized, controlled, non-blinded trial used cyanoacrylate tissue adhesive for umbilical catheter securement. This study randomized 130 neonates in two equal groups. Catheter dislodgement was significantly lower in the intervention group (2.8% vs 26.5%). The data suggested securement by glue and suture significantly reduced catheter dislodgement. This study was completed outside the US using off-label cyanoacrylate formulation yet continues to contribute to the body of knowledge and evidence about using cyanoacrylate with vascular access of all types.

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Weber, M. D., Conlon, T., Connelly, J., & Himebauch, A. S. (2023). **Beside placement of tunneled femorally inserted central catheters in pediatric patients on extracorporeal life support: A case series and discussion.** J Vasc Access.

- Dr. Weber and associates at Children's Hospital of Philadelphia report their success using SecurePortIV tissue adhesive to seal, secure, and protect long-term cuffed and tunneled femoral inserted central catheter access in the pediatric population who also require extracorporeal life support (ECLS). No central line-associated bloodstream infections or deep vein thrombosis were reported in the series of five patients, and the catheter dwell time ranged from 15-182 days.

Piersigilli, F., Iacona, G., Yazami, S., Carkeek, K., Hocq, C., Auriti, C., & Danhaive, O. (2023). **Cyanoacrylate glue as part of a new bundle to decrease neonatal PICC-related complications.** Eur J Pediatr.

- Piersigilli et al. added tissue adhesive to their central line dressing and maintenance bundle in a level III NICU. The results include a significant reduction in CLABSI and dislodgement rates and an increase in catheter dwell time. There were no issues of catheter breakage, patient skin irritation attributed to the use of glue, even in extremely low birthweight infants. Additionally, the use of Steri-Strip® was eliminated.

Barone, G., Pittiruti, M., Prontera, G., Ancora, G., & D'Andrea, V. (2024). **A novel neonatal protocol for Safe Insertion of Umbilical Venous Catheters (SIUVeC): Minimizing complications in placement and management**. J Vasc Access

- Barone et al. provide evidence-based research to reduce complications associated with umbilical catheters. An eight (8) step protocol includes cyanoacrylate (CA) tissue adhesive to secure and protect the catheter exit site. Using CA on the umbilical stump reduces the risk of umbilical venous catheter dislodgement and bleeding, especially during the first 24 hours.

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Studies About the Infection Prevention, Hemostasis & Securement Properties of SecurePortIV® Tissue Adhesive

Zhang S, Price N, Guido A. **Addition of cyanoacrylate adhesive improves the strength of catheter securement and integrity of transparent dressing: Results from an in vitro test model.** J Vasc Access. Mar 1 2023;doi:10.1177/11297298231159177

- In this in vitro study, after the catheter was secured, additional drops of SecurePortIV® catheter securement adhesive were added to the skin and spread where the transparent dressing was to be applied to add to the dressing adherence. Tegaderm™ (9525HP) and SorbaView® SHIELD dressings were tested, using Nexiva™ catheter in a porcine skin model.
    - Regardless of the number of drops used for the spread to secure the dressing, the strength was significantly improved when the dressing was applied immediately instead of waiting
    - Applying 4-8 drops of SPIV under the dressing window with immediate application of the dressing is more effective
- The securement strength using SPIV to secure the catheter AND the dressing is 5.3 to 7.4 times greater. Adding SecurePortIV® adhesive for dressing adherence provides additional stabilization of the catheter and can have a role in decreasing catheter complications and device failures. This is in addition to the already-known benefits of sealing the site, infection reduction, and stopping post-insertion bleeding and oozing. The key innovative feature of SecurePortIV adhesive is its ability to combine multiple areas of vascular access, catheter care, and maintenance. The sterility of SecurePortIV adhesive, microbe reduction, and safety for all ages and vascular access devices make this the best value.

Zhang S, Lingle, B, and Phelps, S. **A Revolutionary, Proven Solution to Vascular Access Concerns: A Review of the Advantageous Properties and Benefits of Catheter Securement Cyanoacrylate Adhesives**. *J Infus Nurs*. May-Jun 01 2022;45(3):154-164.

- Dr. Zhang and colleagues provide an extensive literature review of published evidence about use of catheter securement cyanoacrylate adhesives (CSCAs) use for vascular access securement, providing hemostasis, microbial immobilization, and antibacterial activity.
- Additional research supports use of CSCA's to create a water-resistant barrier seal and adds cost savings through dressing change reduction and decreased nursing time
- CSCA's use in the neonatal and pediatric population is well-studied
- CSCA's are compatible with vascular access catheter materials

Prachanpanich N, Morakul S, Kiatmongkolkul N. **Effectiveness of securing central venous catheters with topical tissue adhesive in patients undergoing cardiac surgery: a randomized controlled pilot study.** *BMC Anesthesiol.* Mar 8 2021;21(1):70.

- Central venous catheters (CVCs) play an important role during cardiac surgery. Topical tissue adhesives form a thin film of coating that becomes bound to keratin in the epidermis. The advantage of this "super glue" lies in its antimicrobial activity. This study aimed to evaluate fixation of CVCs with topical tissue adhesive in patients (prone to bleed) undergoing cardiac surgery regarding its ability to reduce the incidence of pericatheter leakage.
- The study conclusion demonstrated that the use of a topical tissue adhesive can reduce the incidence of immediate postoperative pericatheter blood oozing.

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Guido A, Zhang S, Yang C, et al. **An innovative cyanoacrylate device developed to improve the current standard of care for intravascular catheter securement,** The Journal of Vascular Access 2019, Vol. 21(3) 293-299

- In vitro study demonstrating superior securement for up to 7 days strength vs conventional dressings, bordered dressings, and the Statlock® stabilization device.
- Potent mechanical hemostatic effect associated with the use of an IV catheter securement cyanoacrylate tissue adhesive. The tissue adhesive arm achieved hemostasis 12-fold faster than thromboplastin. A in vivo study comparing the tissue adhesive to two know hemostatic agents was also conducted. The tissue adhesive was found to be significantly equivalent to the two known hemostatic agents.

Waller SC, Anderson DW, Kane BJ, Clough LA. **In Vitro Assessment of Microbial Barrier Properties of Cyanoacrylate Tissue Adhesives and Pressure-Sensitive Adhesives.** *Surg Infect (Larchmt)*. Sep 2019;20(6):449-452

- Most surgical dressings adhere to the skin with pressure-sensitive adhesives. Cyanoacrylate tissue adhesives bond to skin with much greater strength and have inherent antimicrobial properties. This study was designed to compare the microbial barrier properties of common pressure-sensitive adhesives to medical-grade cyanoacrylate tissue adhesives
- Five common bacterial pathogens were used to contaminate 50 cyanoacrylate samples and 150 pressure-sensitive adhesive samples. Each plate was evaluated for bacterial growth underneath the adhesive sample daily for a total of 72 hours.
- No penetration was seen through any of the cyanoacrylate adhesive samples at 72 hours. In sharp contrast, bacteria penetrated 99.3% of the pressure-sensitive adhesive samples at 72 hours.
- Cyanoacrylate tissue adhesives provide a superior microbial barrier compared with common pressure-sensitive adhesives. Consideration could be given to the use of these adhesives for the securement of surgical dressings.

Zhang S, Guido A, Jones R, et al. **Experimental study on the hemostatic effect of cyanoacrylate intended for catheter securement,** The Journal of Vascular Access 2019, Vol. 20(1) 79–86

- In vitro study demonstrating a potent mechanical hemostatic effect associated with the use of an IV catheter securement cyanoacrylate tissue adhesive. The tissue adhesive arm achieved hemostasis 12-fold faster than thromboplastin. A in vivo study comparing the tissue adhesive to two know hemostatic agents was also conducted. The tissue adhesive was found to be significantly equivalent to the two known hemostatic agents.

Prince D, Solanki Z, Varughese R, et al. **Antibacterial effect and proposed mechanism of action of a topical surgical adhesive,** Am J Infect Control. 2017 Aug 22. pii: S0196-6553(17)30861-1

- In vitro study demonstrating bactericidal activity of a 97%+ pure 2-octyl cyanoacrylate killing >7 logs of gram-positive and gram-negative bacteria. Bacterial growth cannot occur in the formulation and on contact death rapidly ensues as a result of a unique mechanism of action that causes cellular water to diffuse from the cell causing cell death. This is the first cyanoacrylate topical skin adhesive demonstrating efficacy against both gram-positive and gram-negative bacteria

Prince D, Kohan K, Solanki Z, et al. **Immobilization and Death of Bacteria by FloraSeal® Microbial Sealant.** Int J Pharma Sci Invent, 2017. 6: p. 45-49

- The key attribute relating to antimicrobial activity of this blended and highly purified cyanoacrylate formulation is it's very anhydrous as demonstrated by its very low water activity. FloraSeal® microbial sealant immobilizes bacteria, prevents exit site contamination by creating a barrier that is impenetrable to microbes, and kills the bacteria that come in contact with it. Note that SecurePortIV and FloraSeal share the same formulation.

Standards, Guidelines and Recommendations

Gorski LA, Hadaway L, et al. **Infusion Nurses Society (INS) 2021 Infusion Therapy Standards of Practice** https://pubmed.ncbi.nlm.nih.gov/33394637/

- The 2021 INS Standards (released Jan 2021) includes Tissue Adhesive (TA) as one of the four approved vascular access securement technologies.
- The benefits of TA include immediate hemostasis at the insertion site which can prolong the interval between dressing changes (Standard 38, pp. S108-S111; Standard 42, pp S119-S121) and creating a barrier to microorganism growth on the catheter (Standard 50, pp S153-S155).
- Tissue adhesive in addition to the primary dressing for peripheral IV's (PIVCs) is recommended to improved catheter dwell times and decrease failure rates and use of tissue adhesive as an alternative to sutures for PICCs is considered to be a safer alternative and reduce risks of complications, including infection and dislodgement (Standard 38, pp. S108-S111).
- Tissue adhesive should be reapplied at each dressing change (Standard 38, pp. S108-S111).

Ostroff, MD. and Connolly, MW. **Ultrasound Guided Vascular Access** https://link.springer.com/book/10.1007/978-3-031-18614-1

- Published in 2022, This casebook covers ultrasound guided vascular access with a focus on patient safety. Fifty chapters present unique patient cases, incorporating the latest technology and techniques for safely and methodically meeting vascular access challenges, detailed discussions on therapeutic interventions, and trouble shooting. All procedures end with the application of 2-Octyl-Cyanoacrylate to protect the catheter.

Sharpe EL., Curry S., Mason Wyckoff M. **Peripherally Inserted Central Catheters: Guideline for Practice.** 4 ed. National Association of Neonatal Nurses; 2022. https://nann.org/education/educational-products/clinical-practice-products

- The National Association of Neonatal Nurses now recommends tissue adhesive cyanoacrylate glue as part of a catheter-related bloodstream infection (CRBSI) reduction bundle and for securement. The use of tissue adhesive in the neonate population reduces therapy failure requiring early device removal. As a securement device, tissue adhesive can minimize catheter movement and prevent dislodgement.

National Institute for Health and Care Excellence (NICE). **SecurePort IV tissue adhesive for use with percutaneous catheters. 2022.** *Medtech innovation briefing*. March 15. https://www.nice.org.uk/guidance/mib288

- The National Institute for Health and Care Excellence (NICE) is an executive non-departmental public body of the Department of Health and Social Care in England. The NICE publishes guidelines in four areas:
    - Use of Health technologies
    - Clinical Practice
    - Guidance for public sector workers on health promotion and ill-health avoidance
    - Guidance for social care services and users
- Experts at NICE advised that this innovative technology could reduce the rates of vascular access catheter dislodgement and infection as well as reducing the need for more frequent dressing changes because of bleeding after insertion of the catheter.
- SecurePortIV combines the benefits of multiple products to seal and secure catheter insertion sites and prevent microbial infection. The technology is formulated to cure flexibly and act like a second skin.

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Nickel, B., Gorski, L., Kleidon, T., Kyes, A., DeVries, M., Keogh, S., Meyer, B., Sarver, M. J., Crickman, R., Ong, J., Clare, S., & Hagle, M. E. (2024). **Infusion Therapy Standards of Practice, 9th Edition.** *J Infus Nurs, 47(1S Suppl 1), S1-S285.* INS Standards of Practice 9th Ed

- Evidence for the use of Cyanoacrylate Tissue Adhesive (TA) is updated in the 9th edition of the INS Standards of practice. One of the four approved securement technologies, high level evidence support its use for hemostasis and infection prevention. Additionally, TA is recommended to reduce peripheral IV failure by enhancing stabilization, especially in high-risk patients and for prolonged catheter dwell. Additionally, evidence is included for use of TA with arterial catheters and for the most fragile premature neonates and low to extremely low birthweight babies.
- TA is recommended to replace PICC sutures, and for CVCs requiring sutures, TA may reduce failure and increase dwell time compared to ASDs and traditional sutures alone.
- TA provides a microbial barrier to reduce infection and has been associated with improved hemostasis to reduce localized bleeding at the insertion site and a reduction in the need for early dressing changes.

Barone, G., D'Andrea, V., Ancora, G., Cresi, F., Maggio, L., Capasso, A., Mastroianni, R., Pozzi, N., Rodriguez-Perez, C., Romitti, M. G., Tota, F., Spagnuolo, F., Raimondi, F., & Pittiruti, M. (2023). **The neonatal DAV-expert algorithm: a GAVeCeLT/GAVePed consensus for the choice of the most appropriate venous access in newborns.** Eur J Pediatr.

- Italian neonatal vascular access experts provide an algorithm for device selection, insertion, care, and management, including the recommendation to cover the exit site with cyanoacrylate glue and transparent dressing.

Spencer, T. R., Imbriaco, G., Bardin-Spencer, A., Mahoney, K. J., Brescia, F., Lamperti, M., & Pittiruti, M. (2023). **Safe Insertion of Arterial Catheters (SIA): An ultrasound-guided protocol to minimize complications for arterial cannulation.** J Vasc Access

- The authors propose a protocol for safely inserting and maintaining arterial catheters, including using cyanoacrylate glue to provide effective securement and a transparent semipermeable membrane dressing to prevent accidental catheter dislodgement and effectively stabilize and protect the exit site. Securing peripheral arterial catheters (PACs) with sutures should be avoided due to the associated local bleeding, the need for repeated dressing changes, and potential needlestick injuries.

Sey, R., Seddik, T., Bowles, S. M., Lund, C., & Mickas, N. (2022). **Preventing HAI in the NICU.** California Perinatal Quality Care Collaborative.

- The California Perinatal Quality Care Collaborative recognizes cyanoacrylate tissue adhesive as a best practice intervention to include among standardized practices to minimize vascular access catheter migration and protect the extraluminal catheter tract from introducing microorganisms.

Hugill, K., van Rens, M., Alderman, A., Kaczmarek, L., Lund, C., & Paradis, A. (2023). **Safe and effective removal of cyanoacrylate vascular access catheter securement adhesive in neonates.** Frontiers in Pediatrics, 11.

- Recognized global experts in neonatal vascular access and use of cyanoacrylate tissue adhesive (TA) guide for safely applying and removing TA in this patient population. This open-access publication recommends using cyanoacrylate for neonatal vascular access securement, explains how TA creates a microbial barrier for infection reduction and enhances dressing adherence. Application of cyanoacrylate TA is safe, and removal occurs through the skin's natural exfoliation. If needed, adhesive remover may be used to release the glue.

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Other Related Publications: Podium Presentations, Posters and More

Alderman, A. (2022, Sept 29-Oct 3, 2022). **Journey to Zero: CLABSI Reduction in the NICU** Association for Vascular Access Scientific Meeting, Minneapolis, MN, USA. https://c53ac34983397363b9e2-fa85729df59db74d0fed9dc21ffea231.ssl.cf1.rackcdn.com//2231264-844210-003.pdf

- Angela Alderman is the Unit Director and Vascular Access Specialist for the Neonatal Intensive Care Nursery at Carilion Children's Hospital in Roanoke, VA, USA. Ms. Alderman reported how her team achieved 1-year CLABSI free through the implementation of an updated CLABSI bundle that included the addition of Tissue Adhesive.

Rodriguez, H., & Nuila, C. (2022, Sept 29-Oct 3, 2022). **Same Approach, Same Outcome? Let's Change Things Up! Tissue Adhesive, a Novel and Complementary Element to CLABSI Prevention** Association for Vascular Access Scientific Meeting, Minneapolis, MN USA. https://c53ac34983397363b9e2-fa85729df59db74d0fed9dc21ffea231.ssl.cf1.rackcdn.com/2052910-1303001-001.pdf

- Holly Rodriguez is a Professional Practice Leader and Cristina Nuila a Manager in Quality Care Management and Performance Improvement, both at Houston Methodist Hospital, Houston, TX, USA. Ms. Rodriguez and Ms. Nuila presented on their quality improvement initiative where they realized an 88% reduction in CLABSI and a 50+% reduction in dressing change frequency association with the use of SecurePortIV®. An abstract of this project was recently published in Crit Care Nurse. Apr 1 2022;42(2):e10- e36. Abstract EB4

Bartowitz, J. (2022, Sept 29-Oct 3, 2022). **Glue to the Rescue: Evaluation of Cyanoacrylate to Improve Dressing Adherence, Hemostasis and Central Line-Associated Bloodstream Infections of Central Venous Catheters** Association for Vascular Access Scientific Meeting, Minneapolis, MN, USA. https://www.eventscribe.net/shared/posters/fullscreen.asp?pvfp=MTMzNjV8NTgxMjcwMDl8MjEzMDk1N3xXZWJzaXRl

- Jenifer Bartowitz is a Vascular Access Specialist at Froedtert Hospital, Milwaukee, WI, USA. She shared the results of a Quality Improvement Project where they achieved a 75% CLABSI Reduction and a trend towards reduced dressing changes associated with the use of SecurePortIV® Catheter Securement Adhesive.

Hatfield, R. (2022, Sept 29-Oct 3, 2022). **Medical ICU – An Antimicrobial Tissue Adhesive Clinical Trial** Association for Vascular Access Scientific Meeting, Minneapolis, MN, USA. https://www.eventscribe.net/shared/posters/fullscreen.asp?pvfp=MTMzNjV8NTgxMjcwMDl8MjEzMDk5M3xXZWJzaXRl

- Rachel Hatfield is an Infection Preventionist and Registered Nurse at Cabell Huntington Hospital, Huntington, WV, USA.
- Ms. Hatfield shared the results of a MICU trial demonstrating a Sustained CLABSI Reduction at Zero associated with the use of Tissue Adhesive.

Holder, M. R. (2022, Sept 29-Oct 3, 2022). **Tissue Adhesive for Peripherally Inserted Central Catheter Securement: A Journey from Pilot to Implementation Across a Large Healthcare System** Association for Vascular Access Scientific Meeting, Minneapolis, MN, USA. https://c53ac34983397363b9e2-fa85729df59db74d0fed9dc21ffea231.ssl.cf1.rackcdn.com/2156429-710464-001.pdf

- Max R. Holder is the Nurse Manager, IV Services/Vascular Access Team/Hemodialysis at Baylor Scott and White Health, Dallas, TX, USA. Mr. Holder presented on their 62% reduction in PICC CLABSI and 50+% reduction in dressing change frequency associated with the use of SecurePortIV® Catheter Securement Adhesive.

Clinical evidence supporting the use of SecurePortIV® Catheter Securement Adhesive

Hunt, D. E. (2022, Sept 29-Oct 3, 2022). *Reducing Bleeding, Reducing CLABSIs: Application of Tissue Adhesive Following Insertion of Peripherally Inserted Central Catheters* Association for Vascular Access Scientific Meeting, Minneapolis, MN, USA.
https://www.eventscribe.net/shared/posters/fullscreen.asp?pvfp=MTMzNjV8NTgxMjcwMDl8MjEzMDk2OXxXZWJzaXRl

- David E. Hunt is a Vascular Access RN at Indiana University Health Ball Memorial Hospital, Muncie, IN, USA. Mr. Hunt shared the results of an Evidence-based Practice Initiative where ZERO CLABSI and a 65% reduction in insertion site bleeding was associated with the use of Tissue Adhesive.

Ullman A, Marsh N, Rickard CM. **Securement for vascular access devices: looking to the future.**
British Journal of Nursing 2017 (IV Therapy Supplement) Vol 26, No 8

- Tissue adhesive used in small amounts (only 1-2 drops at the insertion site and under the hub) has been successfully applied to prevent failure for peripheral intravenous catheters, peripheral arterial catheters, and non-tunneled central venous access devices. Tissue adhesive also has haemostatic properties that reduce post-insertion bleeding and haematomas; which is advantageous for central venous access devices immediately post-insertion. Tissue adhesive's bactericidal properties include inhibition of all Gram-positive organisms (predominant cause of vascular access device associated infections), including Staphylococcus Aureus. Like sutureless securement devices, tissue adhesive is used in conjunction with polyurethane dressings.

Rickard CM, Ullman A, Kleidon T, Marsh N. **Ten Tips for Dressing and Securement of IV Device Wounds.**
ANJM May 2017 Volume 24, No. 10

- "One to two drops of medical grade superglue (cyanoacrylate) applied directly to the wound, and under the hub on insertion, are an effective way to reduce micro-movement, achieve haemostasis in oozy patients, and provide further infection prevention."

Helm RE, Klausner JD, Klemperer JD, et al. **Accepted but unacceptable: peripheral IV catheter failure.**
J Infus Nurs. 2015 May-Jun;38(3):189-203

J Infus Nurs. 2019 May-Jun;42(3):149-150 2019 Follow Up

- A literature review summarizing Peripheral IV Catheter failure rates where a catheter failure was defined as a catheter being removed before the end of its intended dwell time:

  Overall failure rate: 35% – 50%

  Failure mode details:
  Phlebitis: 0.1% – 63.3%
  Infiltration: 15.7% – 33.8%
  Occlusion/mechanical failure: 2.5% – 32.7%
  Dislodgement: 3.7% – 50%
  Infection: 0% – 2.2%

  Average Cost of first stick insertion: $28 to $35

Zhang, S. (2023). **White Paper: Effective Immobilization of Candida auris by SecurePortIV.** HB Fuller | Adhezion Biomedical. click to view

- SecurePortIV® Catheter Securement Adhesive was confirmed to effectively immobilize Candida Auris with an immobilization rate of 99.97% or a log reduction of 3.47. This is the first report on the antibacterial efficacy of cyanoacrylate against this notorious pathogen that has lately become threatening to global medical and health communities. The proven antibacterial efficacy of SecurePortIV® against Candida Auris can help contain, inhibit, and stop the spread of this drug-resistant fungus and protect vulnerable patients, particularly for those with IV catheters.

Clinical evidence supporting the use of SecurePortIV® Catheter Securement Adhesive

Decreasing CLABSI Using Tissue Adhesive. PDF of Slides
Brenda Swendra-Henry, MSN, VA-BC, NPD-BC
Supervisor, Vascular Access Team
CentraCare St. Cloud Hospital St. Cloud, Minnesota

- Brenda presented updated data from a 6-month trial demonstrating a 54% reduction in PICC CLABSIs, achieving a 26% total facility CLABSI reduction estimated to provide more than a $400,000 annual cost savings. In addition, data was presented showing that they achieved zero PICC CLABSIs in the most recent quarter.

PediNeo General Session: Transhepatic and Subcostal Ultrasound Imaging for Catheter Location of Tunneled Mid-thigh Femoral Vein Catheters in Neonates. PDF of Slides
Matthew D. Ostroff, MSN, AGACNP, VABC
Vascular Access Coordinator / Lead APN
St Joseph's University Health Emerson, New Jersey

- Check out this presentation available on-demand on the AVA Learning Academy to see a video of how Matt applies tissue adhesive to secure and protect the catheter at the insertion site.

Insertion and Maintenance of Peripherally Inserted Central Catheter for a Pediatric Epidermolysis Bullosa Patient: A Case Report
Shu-Yin Wang, RN BSN RNC-NIC
Children's Hospital Los Angeles
Temple City, California
ePoster Link

Use of Tissue Adhesive to Reduce Unplanned NICU PICC Dressing Changes
Peggy Holub, MSN, RNC-NIC, CNS, WTA-C - Clinical Nurse Specialist, Rady Children's Hospital
Neonatal Transport Nurse & Chair of NeoVAST Team
Rady Children's Hospital
Oceanside, California
ePoster Link

Impact of Tissue Adhesive Use with PICC Dressings in the NICU: Prospective Quality Improvement Project
Leanne Gonzalez, DNP, APRN, NNP-BC, CCNS-Neonatal
Winnie Palmer Hospital for Women & Babies
Orlando, Florida
ePoster Link

- With the use of SecurePortIV® dressing durations lengthened to a max of 25 days in one case. Mean interval to first dressing change with 10 days. PICC line leakage rates dropped from 12% to 3.8% and 63% of catheters did not require a dressing change before line removal.