NUOVE PROSPETTIVE PER LA PREVENZIONE DELLE INFEZIONI DA CATETERE IN AMBITO PEDIATRICO: USO SISTEMATICO DI PACK PROCEDURALI, LOCK CON TAUROLIDINA, PORT PROTECTORS, FILTRI IN LINEA

GIANCARLO SCOPPETTUOLO

RESPONSABILE UOS DIAGNOSI E CURA DELLE MALATTIE INFETTIVE DI COMUNITA' E TRASMISSIBILI

CONSULENTE INFETTIVOLOGO CENTRO INTERDIPARTIMENTALE ACCESSI VENOSI CENTRALI

COORDINATORE PERCORSO ENDOCARDITE

FONDAZIONE POLICLINICO UNIVERSITARIO A. GEMELLI – IRCCS ROMA

AGENDA

- PACK PROCEDURALI INSERIMENTO E GESTIONE
- TAUROLIDINA
- PORT PROTECTORS

- FILTRI IN LINEA

AGENDA

- **PACK PROCEDURALI INSERIMENTO E GESTIONE**
- TAUROLIDINA
- PORT PROTECTORS

- FILTRI IN LINEA

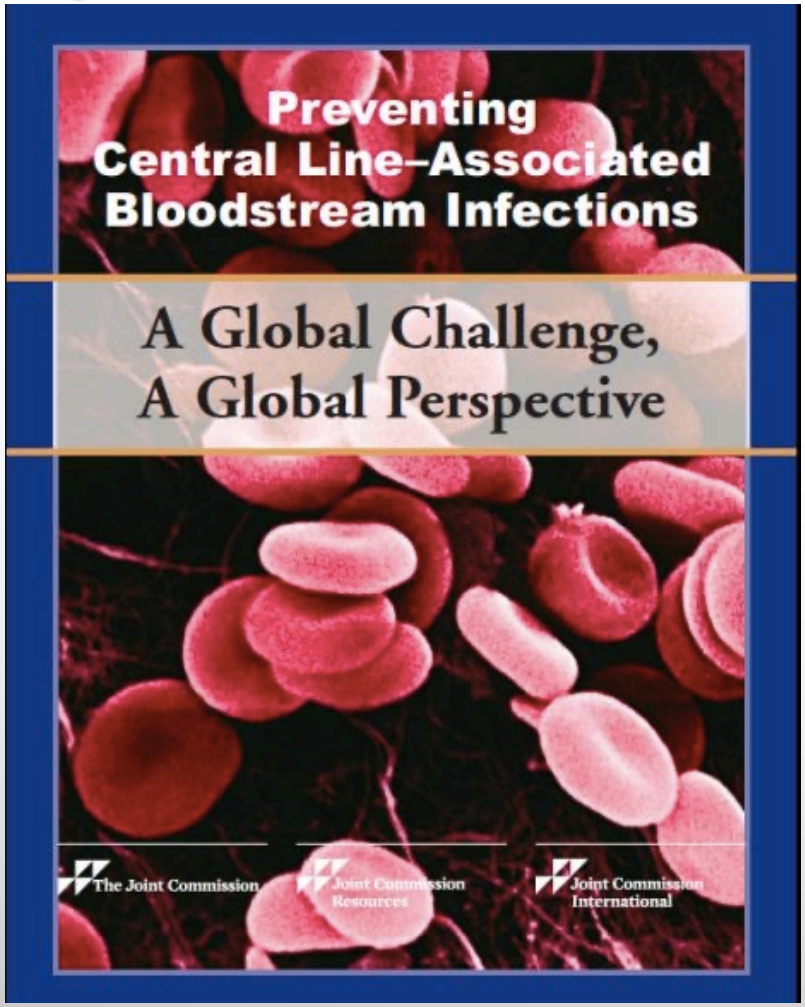
KIT ALL INCLUSIVE PER INSERIMENTO E GESTIONE

MIGLIORAMENTO DELLA COMPLIANCE DEGLI OPERATORI RISPETTO A QUANTO RACCOMANDATO DAI BUNDLES

MIGLIORE COSTO-EFFICACIA DI IMPIANTO E GESTIONE, OTTIMIZZANDO IL MATERIALE E RIDUCENDO I TEMPI DELLA MANOVRA

Guidelines for the Prevention of Intravascular Catheter-Related Infections, 2011

catheters. In addition to educating clinicians about CRBSI prevention, interventions used included: 1) a central venous catheter cart that contained all the necessary supplies; 2) a checklist to ensure adherence to proper practices; 3) stoppage of procedures in non-emergent situations, if evidence- based practices were not being followed; 4) prompt removal of unnecessary central catheters identified during daily patient rounds; 5) feedback to the clinical teams regarding the number of CRBSI episodes and overall rates; and 6) buy-in from the chief executive officers of the participating hospitals that chlorhexidine gluconate products/solutions would be stocked prior to study initiation. Using an interrupted time series analysis and


Preventing
Central Line–Associated
Bloodstream Infections
A Global Challenge,
A Global Perspective
The Joint Commission
Joint Commission Resources
Joint Commission International

2012

Use of Catheter Kits or Carts

Having standardized supply carts or kits with all the necessary CVC insertion and care supplies and equipment in "ready to go" locations saves health care personnel time and helps ensure that the correct supplies and equipment are used for all insertion and maintenance procedures.[18] It is essential that the carts or kits are always stocked and readily accessible. Procedures should be established for used carts to be switched out in a timely manner for newly cleaned and stocked carts. Kits can be kept in unit supply rooms, at

nurses' stations, or at the bedside. Carts and kits can be assembled by health care organizations, using the supplies they prefer, or ready-made kits can be purchased. Carts and kits must contain all supplies recommended by evidence-based practices—for example, a large sterile drape for insertion procedures (rather than a small drape); chlorhexidine for skin antisepsis; and cap, mask, and sterile gloves for inserters and those assisting with the procedure.

Practice Guidelines for Central Venous Access

A Report by the American Society of Anesthesiologists Task Force on Central Venous Access

Recommendations for Resource Preparation. Central venous catheterization should be performed in an environment that permits use of aseptic techniques. A standardized equipment set should be available for central venous access.‖ A checklist or protocol should be used for placement and maintenance of central venous catheters.# An assistant should be used during placement of a central venous catheter.**

2012

Practice Guidelines for Central Venous Access 2020

*An Updated Report by the American Society of Anesthesiologists Task Force on Central Venous Access**

PRACTICE GUIDELINES

- Availability of a standardized equipment set (*e.g.*, kit/cart/set of tools) for central venous catheterization
- Use of a trained assistant for central venous catheterization
- Use of a checklist for central venous catheter placement and maintenance

First Drawer	
Bottles of alcohol-based hand cleanser	2
Transparent bio-occlusive dressings with catheter stabilizer devices	2
Transducer kit: NaCL 0.9% 500 ml bag; single line transducer, pressure bag	1
Needle holder, Webster disposable 5 inch	1
Scissors, 4 1/2 inch Sterile	1
Vascular access tray (chloraprep, sponges, labels)	1
Disposable pen with sterile labels	4
Sterile tubing, arterial line pressure-rated (for manometry)	2
Intravenous connector with needleless valve	4
Second Drawer	
Ultrasound probe cover, sterile 3 x 96	2
Applicator, chloraprep 10.5 ml	3
Surgical hair clipper blade	3
Solution, NaCl bacteriostatic 30 ml	2
Third Drawer	
Surgical hats	6
Goggles	2
Mask, surgical fluid shield	2
Gloves, sterile sizes 6.0–8.0 (2 each size)	10
Packs, sterile gowns	2
Fourth Drawer	

Infection Control & Hospital Epidemiology (2022), 1–17
doi:10.1017/ice.2022.87

SHEA

SHEA/IDSA/APIC Practice Recommendation

Strategies to prevent central line-associated bloodstream infections in acute-care hospitals: 2022 Update

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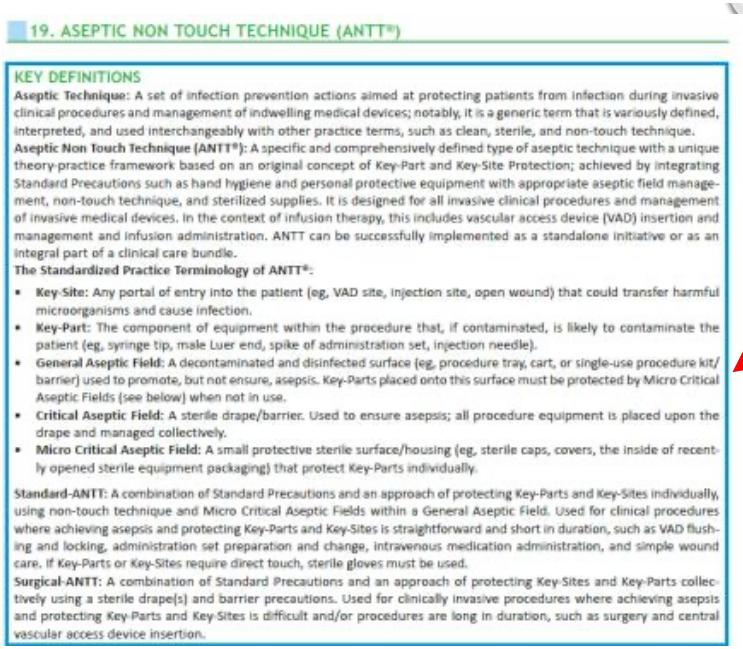
Table 1. Summary of Recommendations to Prevent CLABSI

Essential Practices
Before insertion
1. Provide easy access to an evidence-based list of indications for CVC use to minimize unnecessary CVC placement (Quality of Evidence: LOW)
2. Require education and competency assessment of HCP involved in insertion, care, and maintenance of CVCs about CLABSI prevention (Quality of Evidence: MODERATE)[74–78]
3. Bathe ICU patients aged >2 months with a chlorhexidine preparation on a daily basis (Quality of Evidence: HIGH)[86–90]
At insertion
1. In ICU and non-ICU settings, a facility should have a process in place, such as a checklist, to ensure adherence to infection prevention practices at the time of CVC insertion (Quality of Evidence: MODERATE)[101]
2. Perform hand hygiene prior to catheter insertion or manipulation (Quality of Evidence: MODERATE)[102–107]
3. The subclavian site is preferred to reduce infectious complications when the catheter is placed in the ICU setting (Quality of Evidence: HIGH)[33,37,108–110]
4. Use an all-inclusive catheter cart or kit (Quality of Evidence: MODERATE)[118]
5. Use ultrasound guidance for catheter insertion (Quality of Evidence: HIGH)[119,120]
6. Use maximum sterile barrier precautions during CVC insertion (Quality of Evidence: MODERATE)[123–128]
7. Use an alcoholic chlorhexidine antiseptic for skin preparation (Quality of Evidence: HIGH)[42,129–134]
After insertion
1. Ensure appropriate nurse-to-patient ratio and limit use of float nurses in ICUs (Quality of Evidence: HIGH)[34,35]
2. Use chlorhexidine-containing dressings for CVCs in patients over 2 months of age (Quality of Evidence: HIGH)[45,135–142]
3. For non-tunneled CVCs in adults and children, change transparent dressings and perform site care with a chlorhexidine-based antiseptic at least every 7 days or immediately if the dressing is soiled, loose, or damp. Change gauze dressings every 2 days or earlier if the dressing is soiled, loose, or damp (Quality of Evidence: MODERATE)[145–148]
4. Disinfect catheter hubs, needleless connectors, and injection ports before accessing the catheter (Quality of Evidence: MODERATE)[150–154]
5. Remove nonessential catheters (Quality of Evidence: MODERATE)
6. Routine replacement of administration sets not used for blood, blood products, or lipid formulations can be performed at intervals up to 7 days (Quality of Evidence: HIGH)[164]
7. Perform surveillance for CLABSI in ICU and non-ICU settings (Quality of Evidence: HIGH)[13,165,166]



19. ASEPTIC NON TOUCH TECHNIQUE (ANTT®)

KEY DEFINITIONS

Aseptic Technique: A set of infection prevention actions aimed at protecting patients from infection during invasive clinical procedures and management of indwelling medical devices; notably, it is a generic term that is variously defined, interpreted, and used interchangeably with other practice terms, such as clean, sterile, and non-touch technique.

Aseptic Non Touch Technique (ANTT®): A specific and comprehensively defined type of aseptic technique with a unique theory-practice framework based on an original concept of Key-Part and Key-Site Protection; achieved by integrating Standard Precautions such as hand hygiene and personal protective equipment with appropriate aseptic field management, non-touch technique, and sterilized supplies. It is designed for all invasive clinical procedures and management of invasive medical devices. In the context of infusion therapy, this includes vascular access device (VAD) insertion and management and infusion administration. ANTT can be successfully implemented as a standalone initiative or as an integral part of a clinical care bundle.

The Standardized Practice Terminology of ANTT®:

- **Key-Site:** Any portal of entry into the patient (eg, VAD site, injection site, open wound) that could transfer harmful microorganisms and cause infection.
- **Key-Part:** The component of equipment within the procedure that, if contaminated, is likely to contaminate the patient (eg, syringe tip, male Luer end, spike of administration set, injection needle).
- **General Aseptic Field:** A decontaminated and disinfected surface (eg, procedure tray, cart, or single-use procedure kit/barrier) used to promote, but not ensure, asepsis. Key-Parts placed onto this surface must be protected by Micro Critical Aseptic Fields (see below) when not in use.
- **Critical Aseptic Field:** A sterile drape/barrier. Used to ensure asepsis; all procedure equipment is placed upon the drape and managed collectively.
- **Micro Critical Aseptic Field:** A small protective sterile surface/housing (eg, sterile caps, covers, the inside of recently opened sterile equipment packaging) that protect Key-Parts individually.

Standard-ANTT: A combination of Standard Precautions and an approach of protecting Key-Parts and Key-Sites individually, using non-touch technique and Micro Critical Aseptic Fields within a General Aseptic Field. Used for clinical procedures where achieving asepsis and protecting Key-Parts and Key-Sites is straightforward and short in duration, such as VAD flushing and locking, administration set preparation and change, intravenous medication administration, and simple wound care. If Key-Parts or Key-Sites require direct touch, sterile gloves must be used.

Surgical-ANTT: A combination of Standard Precautions and an approach of protecting Key-Sites and Key-Parts collectively using a sterile drape(s) and barrier precautions. Used for clinically invasive procedures where achieving asepsis and protecting Key-Parts and Key-Sites is difficult and/or procedures are long in duration, such as surgery and central vascular access device insertion.

II. CVADs

A. Implement the central line bundle when placing CVADs (hand hygiene, skin antisepsis with alcohol-based chlorhexidine, maximal sterile barrier precautions, upper body insertion, if able) (refer to Standard 47, *Infection*).
   1. Use a standardized checklist to ensure adherence to mandatory insertion practices. The checklist should be completed by an educated health care clinician assisting with the CVAD procedure.[25,26] (III)
   2. Use a standardized supply cart or kit that contains all necessary components for the insertion of a CVAD.[26-28] (IV)

Fenik et al. BMC Medical Education 2013, 13:60
http://www.biomedcentral.com/1472-6920/13/60

BMC Medical Education

RESEARCH ARTICLE Open Access

Prepackaged central line kits reduce procedural mistakes during central line insertion: a randomized controlled prospective trial

Yelena Fenik[1†], Nora Celebi[2*†], Robert Wagner[2], Christoph Nikendei[3], Frederike Lund[3], Stephan Zipfel[4], Reimer Riessen[5] and Peter Weyrich[2]

Abstract

Background: Central line catheter insertion is a complex procedure with a high cognitive load for novices. Providing a prepackaged all-inclusive kit is a simple measure that may reduce the cognitive load. We assessed whether the use of prepackaged all-inclusive central line insertion kits reduces procedural mistakes during central line catheter insertion by novices.

Methods: Thirty final year medical students and recently qualified physicians were randomized into two equal groups. One group used a prepackaged all-inclusive kit and the other used a standard kit containing only the central vein catheter and all other separately packaged components provided in a materials cart. The procedure was videotaped and analyzed by two blinded raters using a checklist. Both groups performed central line catheter insertion on a manikin, assisted by nursing students.

Results: The prepackaged kit group outperformed the standard kit group in four of the five quality indicators: procedure duration (26:26 ± 3:50 min vs. 31:27 ± 5:57 min, $p = .01$); major technical mistakes (3.1 ± 1.4 vs. 4.8 ± 2.6, $p = .03$); minor technical mistakes (5.2 ± 1.7 vs. 8.0 ± 3.2, $p = .01$); and correct steps (83 ± 5% vs. 75 ± 11%, $p = .02$). The difference for breaches of aseptic technique (1.2 ± 0.8 vs. 3.0 ± 3.6, $p = .06$) was not statistically significant.

Conclusions: Prepackaged all-inclusive kits for novices improved the procedure quality and saved staff time resources in a controlled simulation environment. Future studies are needed to address whether central line kits also improve patient safety in hospital settings.

Keywords: Central catheter placement, Cognitive load, Split-attention principle

PACK DI INSERIMENTO PER ADULTI E NEONATI

PACK DI GESTIONE

EVOkit full

AGENDA

- PACK PROCEDURALI INSERIMENTO E GESTIONE
- **TAUROLIDINA**
- PORT PROTECTORS

- FILTRI IN LINEA

EXPERT REVIEWS

Antibiotic-lock therapy: a clinical viewpoint

Expert Rev. Anti Infect. Ther. 12(1), 117–129 (2014)

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Antibiotic lock therapy (ALT) – instillation of high concentrations of anti-microbial agent with or without anti-coagulant into the lumen of central venous catheters – is considered a valid conservative treatment for catheter-related bloodstream infection (CRBSI) in patients highly dependent on maintaining the catheter. Results from randomized controlled studies have indicated that the effectiveness of ALT is moderate, but recent findings from experimental studies and observational case series point to considerable efficacy and safety of this therapy, which is usually associated with concomitant systemic treatment. In this article, the current knowledge about ALT for patients with CRBSI is reviewed and discussed, with emphasis on existing controversies and the results obtained according to the various uses of the catheters and the etiologies of infection.

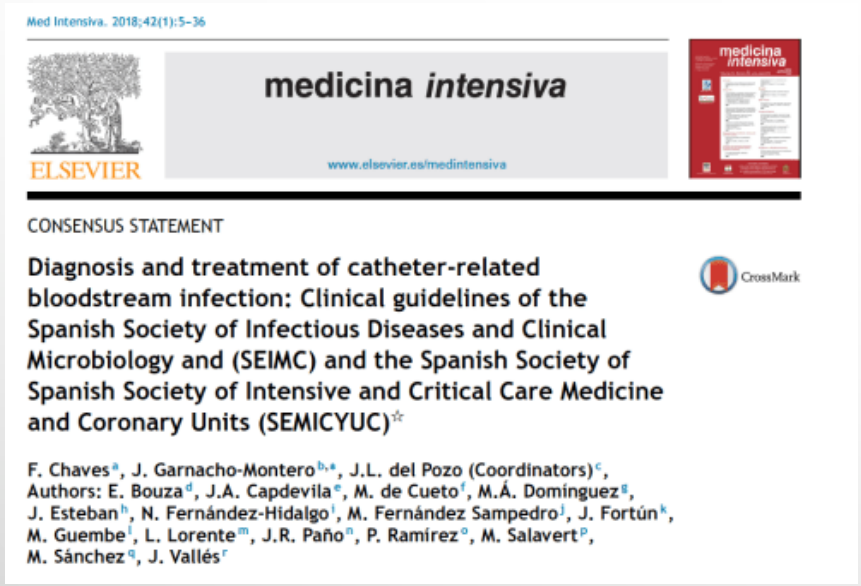
KEYWORDS: antibiotic lock therapy • catheter-related sepsis • conservative management • permanent central venous catheter

ANTIMICROBIAL LOCK PROPHYLAXIS

SHEA/IDSA 2022 GUIDELINES, FOR THE POTENTIAL EMERGENCE OF ANTIMICROBIAL RESISTANCE, SUGGEST TO USE ANTIBIOTIC LOCK SOLUTIONS AS A PREVENTIVE STRATEGY ONLY FOR THE FOLLOWING: A) **PATIENTS WITH LONG-TERM HEMODIALYSIS CATHETERS; B) PATIENTS WITH LIMITED VENOUS ACCESS AND A HISTORY OF RECURRENT CLABSI; C) PATIENTS WHO ARE AT HEIGHTENED RISK OF SEVERE SEQUELAE FROM A CLABSI (EG, PATIENT WITH RECENTLY IMPLANTED INTRAVASCULAR DEVICES, SUCH AS PROSTHETIC HEART VALVE OR AORTIC GRAFT).**

INS 2024: **USE ANTIMICROBIAL LOCKING SOLUTIONS FOR THERAPEUTIC AND PROPHYLACTIC PURPOSES IN PATIENTS WITH LONG-TERM CVADS IN THE FOLLOWING CIRCUMSTANCES: A) PATIENTS WITH A HISTORY OF MULTIPLE CLABSIS; B) HIGH-RISK PATIENT POPULATIONS; C) IN FACILITIES WITH UNACCEPTABLY HIGH RATES OF CLABSI, DESPITE IMPLEMENTATION OF OTHER METHODS OF INFECTION PREVENTION.**

IDEAL LOCK SOLUTION



Med Intensiva. 2018;42(1):5–36

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CONSENSUS STATEMENT

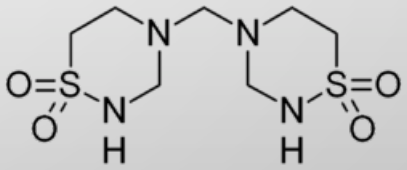
Diagnosis and treatment of catheter-related bloodstream infection: Clinical guidelines of the Spanish Society of Infectious Diseases and Clinical Microbiology and (SEIMC) and the Spanish Society of Spanish Society of Intensive and Critical Care Medicine and Coronary Units (SEMICYUC)☆

F. Chaves[a], J. Garnacho-Montero[b,*], J.L. del Pozo (Coordinators)[c], Authors: E. Bouza[d], J.A. Capdevila[e], M. de Cueto[f], M.Á. Domínguez[g], J. Esteban[h], N. Fernández-Hidalgo[i], M. Fernández Sampedro[j], J. Fortún[k], M. Guembe[l], L. Lorente[m], J.R. Paño[n], P. Ramírez[o], M. Salavert[p], M. Sánchez[q], J. Vallés[r]

- SPECTRUM OF ACTIVITY SHOULD INCLUDE COMMON OR TARGETED PATHOGENS
- ABILITY TO PENETRATE O DISRUPT A BIOFILM
- COMPATIBILITY WITH ANTICOAGULANTS
- PROLONGED STABILITY
- LOW RISK OF TOXICITY OR ADVERSE EVENTS
- LOW POTENTIAL FOR RESISTANCE
- COST EFFECTIVENESS

TAUROLIDINE

- TAUROLIDINE IS A TAURINE AMINO ACID DERIVATIVE; IT IS AN ANTIMICROBIAL AGENT WITH BROAD SPECTRUM OF ANTIBACTERIAL AND ANTIFUNGAL ACTION
- THE METHYL DERIVATIVES OF TAUROLIDINE INTERACT WITH THE BACTERIAL WALL (PARTICULARLY FLAGELLA AND FIMBRIAE), CAUSING IRREVERSIBLE DAMAGE TO THE BACTERIAL WALL, WHICH CONSISTS OF AN INABILITY TO ADHERE (THUS AN INABILITY TO FORM BIOFILM!)
- UNLIKE ANTIBIOTICS, TAUROLIDINE ACTS BY A CHEMICAL REACTION AT THE LEVEL OF THE BACTERIAL WALL.
- THE OTHER MECHANISM OF ACTION IS THE INACTIVATION OF BACTERIAL EXO- AND ENDOTOXINS. THIS MAKES THE INDUCTION OF BACTERIAL RESISTANCE HIGHLY UNLIKELY.
- TAUROLIDINE HAS A BACTERICIDAL EFFECT ON GRAM-POSITIVE AND GRAM-NEGATIVE BACTERIA, INCLUDING MDR, AND FUNGI.
- THERE ARE CURRENTLY NO REPORTED RESISTANCES TO TAUROLIDINE.



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DOI: 10.5301/jva.5000576

REVIEW

Evidence-based criteria for the choice and the clinical use of the most appropriate lock solutions for central venous catheters (excluding dialysis catheters): a GAVeCeLT consensus

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TABLE I - Panel recommendations

The role of lock in preventing occlusion of NDCVA

The role of anticoagulant lock is only marginally important in the management of NDCVA, in terms of prevention of lumen occlusion.

Future assessment of the role of citrate lock in NDCVA is desirable and considered of increasing importance. The benefit of citrate might be more focused on its action against biofilm and against bacteria rather than on its anticoagulant effect.

Heparin lock and citrate lock both guarantee an effective anticoagulant action, which is proven to be useful in DCVA rather than in NDCVA.

Trombolytic/fibrinolytic drugs, as currently available, are neither safe nor cost-effective for prevention of occlusion of NDCVA, while they have a definite role in the treatment of lumen occlusion due to blood clots.

Saline lock is as appropriate as anticoagulant lock in prevention of occlusion of NDCVA.

A pulsatile positive "push and pause" ("start and stop") technique is the most appropriate methodology of flushing.

The role of lock in preventing infection of NDCVA

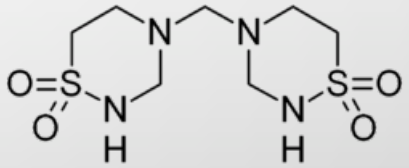
While antibacterial lock (specifically with antibiotics) has a clear role in clinical practice as a treatment of some selected catheter-related blood stream infection, the use of antibacterial lock for the purpose of prevention of catheter colonization and/or infection is a new field which demands further research, as it may prove to have an important clinical role in some selected populations of high risk patients where the standard bundles of infection prevention appear to be ineffective or insufficient.

Non-antibiotic antibacterial lock will have a major future role for prevention of catheter colonization and infection. While ethanol lock is highly effective, due to concerns about its safety, the drugs most likely to be used as antibacterial lock are taurolidine and citrate, which have optimal characteristics in terms of safety, efficacy and cost-effectiveness.

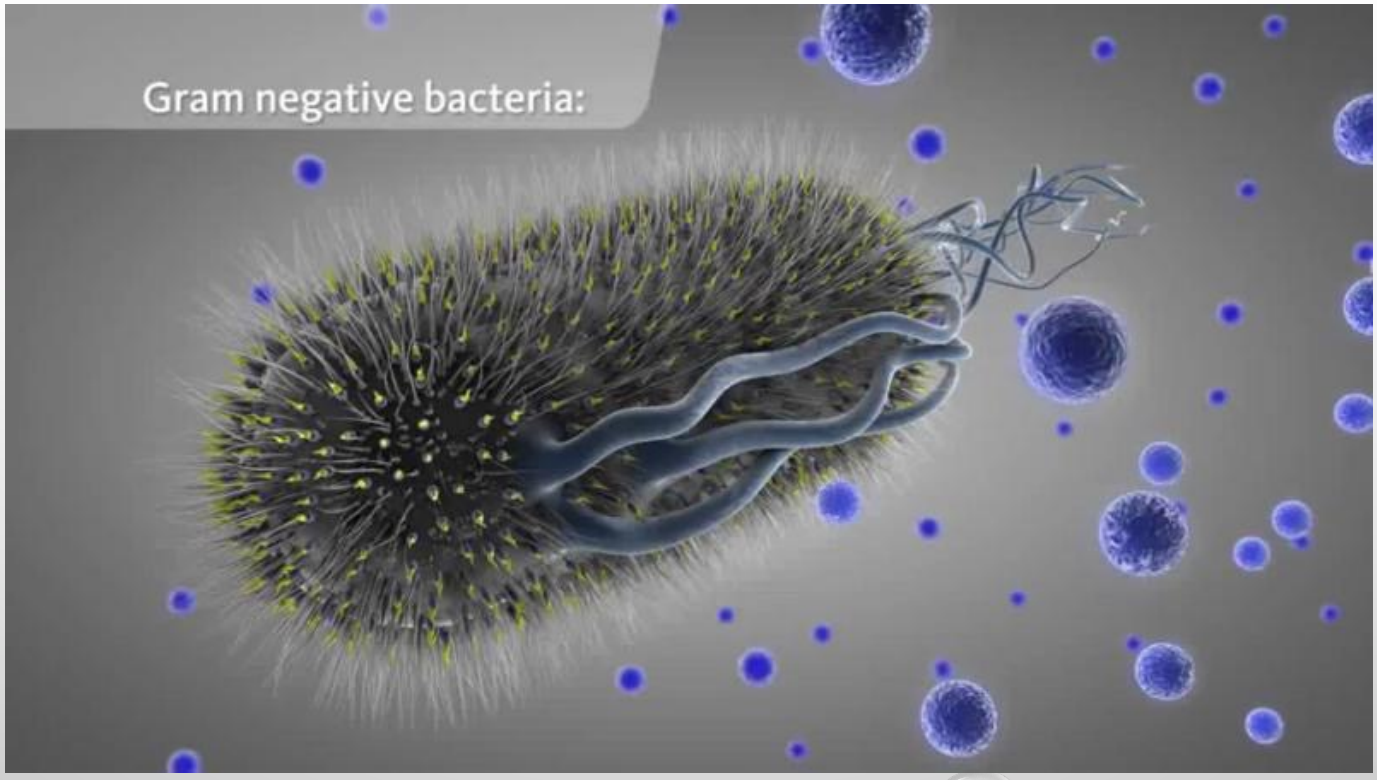
The association that is most promising as antibacterial/anticoagulant lock, in NDCVA as in DCVA, is taurolidine/citrate. Further studies should clarify which populations of patients might benefit of this association, and which concentrations of taurolidine and of citrate might be associated with the best outcome in terms of safety and efficacy.

TAUROLIDINA: FORMULAZIONI DISPONIBILI

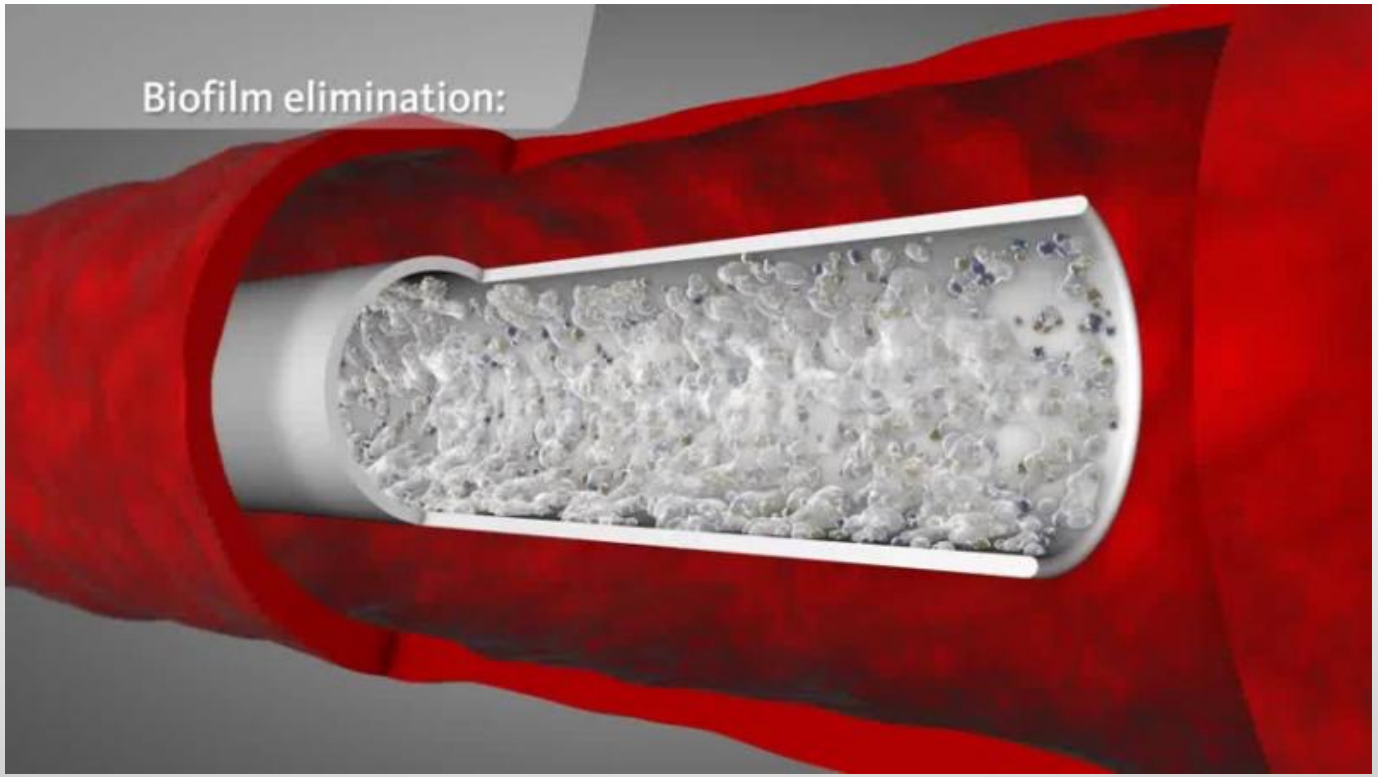
- TAUROLIDINA (1.35% OR 2%)
- TAUROLIDINA + CITRATO 4%
- TAUROLIDINA + CITRATO 4% + EPARINA
- TAUROLIDINA + CITRATO 4% + UROKINASI



TAUROLIDINA: MECCANISMO DI AZIONE



TAUROLIDINA: ELIMINAZIONE DEL BIOFILM SULLA PARETE INTERNA DI UN CATETERE



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International Journal of Antimicrobial Agents 24 (2004) 491–495

INTERNATIONAL JOURNAL OF Antimicrobial Agents

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Taurolidine is effective in the treatment of central venous catheter-related bloodstream infections in cancer patients

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Abstract

Taurolidine is an antimicrobial agent that was originally used in the local treatment of peritonitis and was shown to be effective in the prevention of catheter-related bloodstream infections (CR-BSI). In this pilot study, we used taurolidine solution as an intravenous (i.v.) lock into the totally implantable intravascular devices of 11 consecutive oncological patients with catheter-related bloodstream infections not responding to systemic antimicrobial chemotherapy. All patients recovered completely from the infection. No adverse drug effects were seen. Three patients were successfully retreated for a recurrent infection. Our data suggest a beneficial role of taurolidine i.v. lock for the therapy of catheter-related bloodstream infections in oncological patients. Taurolidine i.v. lock application is feasible and could especially be useful in infections resistant to antibiotic chemotherapy.
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Keywords: Totally implantable intravascular devices; Taurolidine; Antimicrobial lock solution; Bloodstream infections; Treatment

11 oncologic pts
Failure with antimicrobials ev alone
Eradication rate: 100%

Original Communication

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Strategies to Reduce Catheter-Related Bloodstream Infections in Pediatric Patients Receiving Home Parenteral Nutrition: The Efficacy of Taurolidine-Citrate Prophylactic-Locking

Cecile Lambe, MD[1]; Catherine Poisson[1]; Cecile Talbotec, MD[1]; and Olivier Goulet, MD, PhD[1,2]

Abstract

Background: Catheter-related bloodstream infections (CRBSIs) remain a major issue in patients who are receiving home parenteral nutrition (HPN). The aim of this interventional study was to assess the impact of a new strategy using taurolidine-citrate (T-C) prophylactic locks on the CRBSI rate in children with intestinal failure who are receiving HPN. *Methods:* The rate of CRBSIs was monitored every calendar year in a prospective cohort of 195 children with intestinal failure. T-C locks were initiated from October 2011 in children with recurring CRBSIs (≥2 episodes per year). *Results:* In the whole cohort, the median annual CRBSI rate per 1000 catheter days decreased significantly from 2.07 in 2008 to 2010 to 1.23 in 2012 to 2014 ($P < .05$). T-C locks were used in 40 patients. No adverse events were reported. In taurolidine-treated patients, the CRBSI rate per 1000 catheter days decreased from 4.16 to 0.25 ($P < .0001$). The cumulative percentage of patients free of CRBSI at 18 months was 92% (95% confidence interval [CI]: 71–98) on T-C lock vs 61% (95% CI: 49–72) in controls ($P = .01$). In multivariate analysis, factors associated with CRBSI were immune deficiency (adjusted hazard ratio 3.49; 95% CI: 1.01–12.17) and the young age of the parents (adjusted hazard ratio 4.79, 95% CI: 2.16–10.62), whereas T-C locks were protective (adjusted hazard ratio 0.22, 95% CI: 0.06–0.74). *Conclusion:* This study confirms the efficacy of T-C catheter locks in decreasing the incidence of CRBSIs in children with intestinal failure who are receiving HPN. (*JPEN J Parenter Enteral Nutr.* 2018;42:1017–1025)

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Original research articles

Taurolidine lock in the treatment of colonization and infection of totally implanted venous access devices in cancer patients

Fabrizio Brescia [1], Mauro Pittiruti [2], Giancarlo Scoppettuolo[3], Chiara Zanier[1], Elisa Nadalini[1], Paola Bottos[1], Chiara Moreal[1], Valentina Da Ros[4], and Fabio Fabiani[1]

Background: Taurolidine lock is known to be effective in preventing catheter-related infections in a variety of venous access devices, including long term venous access devices for chemotherapy. Though, literature about the use of taurolidine for treating catheter colonization or catheter-related blood stream infection is scarce.

Method: We have retrospectively reviewed the safety and efficacy of 2% taurolidine lock for treatment of catheter-colonization and of catheter-related bloodstream infection in cancer patients with totally implanted venous access devices. Diagnosis of colonization or catheter-related infection was based on paired peripheral and central blood cultures, according to the method of Delayed Time to Positivity.

Results: We recorded 24 cases of catheter-related infection and two cases of colonization. Taurolidine lock—associated with systemic antibiotic therapy—was successful in treating all cases of catheter-related infection, with disappearance of clinical symptoms, normalization of laboratory values, and eventually negative blood cultures. Taurolidine lock was also safe and effective in treating device colonization. No adverse effect was reported.

Conclusion: In our retrospective analysis, 2% taurolidine lock was completely safe and highly effective in the treatment of both catheter-colonization and catheter-related bloodstream infection in cancer patients with totally implanted venous access devices.

Keywords

Oncology access, techniques and procedures, catheter-related bloodstream infection, catheter-colonization, taurolidine lock

JPEN J Parenter Enteral Nutr. 2024 Apr 11. doi: 10.1002/jpen.2630. Online ahead of print.

Catheter salvage or removal in catheter-related bloodstream infections with Staphylococcus aureus in children with chronic intestinal failure receiving home parenteral nutrition and the use of prophylactic taurolidine catheter lock solution: A descriptive cohort study

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Affiliations + expand

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Abstract

Background: Children with chronic IF require long-term home parenteral nutrition (HPN), administered through a central venous catheter. Catheter-related bloodstream infection (CRBSI) with Staphylococcus aureus is known to be a serious infection with a high mortality rate and risk of complications. A standardized protocol on the management of S aureus CRBSIs in children receiving HPN is lacking. The aim of this study is to evaluate the effectiveness and safety of the current management in an HPN expertise center in the Netherlands.

Methods: We performed a retrospective descriptive cohort study between 2013 and 2022 on children 0-18 years of age with chronic IF requiring long-term HPN. Our primary outcomes were the incidence of S aureus CRBSI per 1000 catheter days, catheter salvage attempt rate, and successful catheter salvage rate. Our secondary outcomes included complications and mortality.

Results: A total of 74 patients (39 male; 53%) were included, covering 327.8 catheter years. Twenty-eight patients (38%) had a total of 52 S aureus CRBSIs, with an incidence rate of 0.4 per 1000 catheter days. The catheter salvage attempt rate was 44% (23/52). The successful catheter salvage rate was 100%. No relapse occurred, and no removal was needed after catheter salvage. All complications that occurred were already present at admission before the decision to remove the catheter or not. No patients died because of an S aureus CRBSI.

Conclusion: Catheter salvage in S aureus CRBSIs in children receiving HPN can be attempted after careful consideration by a multidisciplinary team in an HPN expertise center.

Keywords: Staphylococcus aureus; catheter-related bloodstream infection; intestinal failure; pediatric.

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Use of 2% taurolidine lock solution for treatment and prevention of catheter-related bloodstream infections in neonates: a feasibility study

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SUMMARY

Background: Taurolidine lock, a technique used to prevent or treat catheter-related bloodstream infection (CRBSI), is effective in adult and paediatric patients but has been described rarely in neonates. The aim of this descriptive retrospective study, was to determine the feasibility and direct outcomes of prophylactic and therapeutic taurolidine locks in term and preterm neonates.

Methods: We implemented the use of therapeutic taurolidine lock in addition to antibiotic treatment with the aim of catheter salvage in critical neonates with difficult vascular access (group 1). In addition, we introduced taurolidine lock as a preventive measure in neonates with a central venous catheter (CVC) at high risk of developing CRBSI (group 2). Every 24 h (in the treatment group) a 2% taurolidine solution was injected and the catheter locked for at least 120 min, until infection clearance (group 1). In the preventive group, the catheter was locked for 30 min every 48 h until CVC removal (group 2).

Findings: Thirty-seven neonates who received taurolidine were included in this study. We did not observe any major adverse events. In group 1 (21 cases), clinical symptom disappearance and bacteraemia clearance were achieved without catheter removal in 18 cases (85.7%); in the other three neonates the catheter was removed shortly after the start of the locks as it was possible to replace the CVC. In group 2 (16 neonates), no CRBSI was observed during the duration of the catheter placement.

Conclusions: In this retrospective study, taurolidine was successfully used in neonates both for prevention and treatment of CRBSI, without major undesired effects. A larger cohort and a randomized clinical trial is warranted in order to establish its efficacy and safety in neonates.

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ARÁN

Nutrición Hospitalaria

Revisión

Evidence-based recommendations of the Andalusian Group for Nutrition Reflection and Investigation (GARIN) for the management of adult patients with short bowel syndrome

Recomendaciones basadas en la evidencia del Grupo Andaluz para la Reflexión e Investigación en Nutrición (GARIN) para el manejo del paciente con síndrome de intestino corto

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Abstract

In order to develop evidence-based recommendations and expert consensus for the nutritional management of patients with short bowel syndrome (SBS), we conducted a systematic literature search using the PRISMA methodology plus a critical appraisal following the GRADE scale procedures. Pharmacological treatment with antisecretory drugs, antidiarrheal drugs, and somatostatin contributes to reducing intestinal losses. Nutritional support is based on parenteral nutrition; however, oral intake and/or enteral nutrition should be introduced as soon as possible. In the chronic phase, the diet should have as few restrictions as possible, and be adapted to the SBS type. Home parenteral nutrition (HPN) should be individualized. Single-lumen catheters are recommended and taurolidine should be used for locking the catheter. The HPN's lipid content must be greater than 1 g/kg per week but not exceed 1 g/kg per day, and omega-6 fatty acids (ω6 FAs) should be reduced. Trace element vials with low doses of manganese should be used. Patients with chronic SBS who require long-term HPN/fluid therapy despite optimized treatment should be considered for teduglutide treatment. All patients require a multidisciplinary approach and specialized follow-up. These recommendations and suggestions regarding nutritional management in SBS patients have direct clinical applicability.

Keywords:

Short bowel syndrome. Home parenteral nutrition. Teduglutide.

Received: 19/05/2021 • Accepted: 22/06/2021

Home parenteral nutrition	
What is the catheter of choice for HPN in patients with SBS?	
As a consensus of experts our proposal is to individualise the choice of access based on the patient's characteristics and the site's experience	95.38 %
We recommend using single-lumen catheters or using a lumen exclusively for PN when using multiple-lumen catheters	100 %
What is the ideal catheter lock?	
We recommend locking the catheter with taurolidine in all cases	98.46 %
What method of administration should we use?	
We suggest administering the HPN cyclically	98.46 %

INS 2024

O. Use antimicrobial locking solutions for therapeutic and prophylactic purposes in patients with long-term CVADs in the following circumstances: patients with a history of multiple CABSIs, high-risk patient populations, and in facilities with unacceptably high rates of CLABSI, despite implementation of other methods of infection prevention (see Standard 61, *Parenteral Nutrition*).[15,39,46-53] (II)

b. Antiseptic locking solutions include solutions used alone or in numerous combinations, including, but not limited to, ethanol, sodium bicarbonate, taurolidine, citrate, concentrated sodium chloride, and ethylenediaminetetraacetic acid (EDTA).[15,49-51,53-56] (II)

AGENDA

- PACK PROCEDURALI INSERIMENTO E GESTIONE
- TAUROLIDINA
- **PORT PROTECTORS**

- FILTRI IN LINEA

NEEDLEFREE CONNECTORS: DISINFEZIONE ATTIVA O PASSIVA (PORT PROTECTORS)?

DISINFEZIONE ATTIVA

DISINFEZIONE PASSIVA: PORT PROTECTORS

Infusion Therapy Standards of Practice

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9TH EDITION
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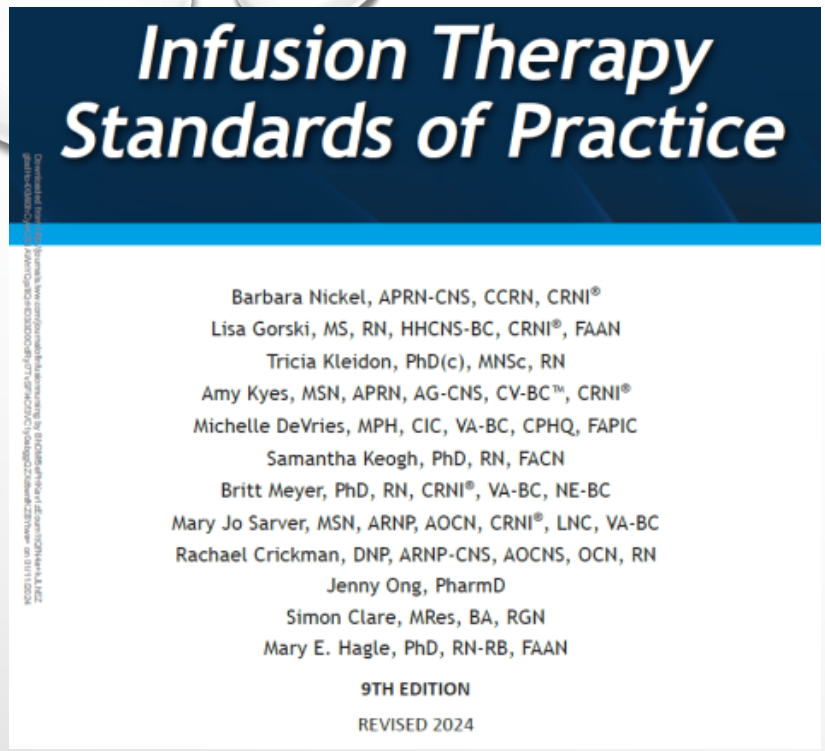
E. Disinfect the connection surface and sides of the needleless connector attached to any VAD to reduce introduction of intraluminal microbes. Use active or passive disinfection. Follow manufacturers' directions for use of both the needleless connector and disinfectant agent and/or product. Primary factors influencing this practice include the disinfection agent, the time required (ie, application and drying), and the method of application.

1. Perform active disinfection by a vigorous mechanical scrub using a flat swab pad containing 70% isopropyl alcohol or alcohol-based chlorhexidine suitable for use with medical devices.
   a. Laboratory simulation demonstrated greatest bacterial elimination rates associated with scrubbing in a straight line (compared with rotational scrubbing), using a force equal to that when applying arterial compression, and when the connector is scrubbed twice with a new swab each time.[27] (V)
   b. Recent studies show varied effectiveness of scrub time between 5 and 15 seconds with 70% isopropyl alcohol and alcohol-based chlorhexidine gluconate. One study showed comparable decontamination, and another demonstrated superior decontamination with longer decontamination time.[28,29] (III)
   c. Similarly, varied effectiveness has been reported with different solutions. Some studies showed comparable effectiveness in decontamination between 70% isopropyl alcohol or alcohol-based chlorhexidine and others demonstrated superior decontamination with alcohol-based chlorhexidine. International guidelines recommend either solution as part of good Aseptic Non Touch Technique (ANTT®) practice.[30-32] (II)
2. Adequate needleless connector drying time after disinfection is essential to reduce microbial load and potential for entry into the bloodstream, thus reducing bloodstream infections. Observational research demonstrated drying time with 70% isopropyl alcohol is 5 seconds; alcohol-based chlorhexidine requires 20 seconds. Povidone-iodine requires longer than 6 minutes to be thoroughly dry, making it less favorable to clinical practice. Drying times in clinical practice depend on the humidity and climate in the care setting.[33] (IV)



E. Disinfect the connection surface and sides of the needleless connector attached to any VAD to reduce introduction of intraluminal microbes. Use active or passive disinfection. Follow manufacturers' directions for use of both the needleless connector and disinfectant agent and/or product. Primary factors influencing this practice include the disinfection agent, the time required (ie, application and drying), and the method of application.

3. Consider passive disinfection by applying a cap or covering containing a disinfectant agent (eg, 70% isopropyl alcohol, iodinated alcohol, chlorhexidine gluconate) over the needleless connector. A systematic review (of randomized and nonrandomized studies) has demonstrated high level of decontamination compliance and reductions in central line-associated bloodstream infection (CLABSI) rates and related health care costs associated with avoided harm. When using caps, follow manufacturers' directions for use regarding time for effectiveness after attaching and the maximum length of effectiveness. Once removed, discard used disinfection caps and do not reattach to the needleless connector. Use multidisciplinary implementation strategies, including staff education and leadership support, and provide consistent feedback to staff regarding outcomes, as this has been shown to decrease catheter-associated bloodstream infection (CABSI) rates.[34-37] (II)
4. Studies comparing active and passive methods of disinfection show both processes to be effective.
   a. Active disinfection with alcohol-based chlorhexidine gluconate swab pads or passive disinfection with caps containing 70% isopropyl alcohol were associated with lower rates of CABSI, while swab pads containing 70% isopropyl alcohol were the least effective, according to a meta-analysis of quasi-experimental studies.[30] (II)
   b. Recent research has demonstrated that passive decontamination with 70% isopropyl alcohol–impregnated caps was associated with reduced phlebitis and infection. This may be associated with the improved consistency with decontamination practice and/or prolonged exposure to disinfectant agent.[38-45] (II)
   c. Compared to active disinfection, passive disinfection has been associated with increased clinician compliance largely due to the continuous dwell nature of the device.[46,47] (IV)
      i. However, other studies show no difference between passive decontamination with caps and active decontamination with swabs. More high-quality trial research is required.[48,49] (III)

RESEARCH ARTICLE Open Access

Educational interventions alone and combined with port protector reduce the rate of central venous catheter infection and colonization in respiratory semi-intensive care unit

Riccardo Inchingolo[1*], Giuliana Pasciuto[1], Daniele Magnini[1], Manuela Cavalletti[1], Giancarlo Scoppettuolo[2], Giuliano Montemurro[1], Andrea Smargiassi[1], Riccardo Torelli[3], Maurizio Sanguinetti[3,4], Teresa Spanu[3,4], Giuseppe Maria Corbo [1,5] and Luca Richeldi[1,5]

Abstract

Background: Central Line-Associated BloodStream Infections (CLABSIs) are emerging challenge in Respiratory semi-Intensive Care Units (RICUs). We evaluated efficacy of educational interventions on rate of CLABSIs and effects of port protector as adjuvant tool.

Methods: Study lasted 18 months (9 months of observation and 9 of intervention). We enrolled patients with central venous catheter (CVC): 1) placed during hospitalization in RICU; 2) already placed without signs of systemic inflammatory response syndrome (SIRS) within 48 h after the admission; 3) already placed without evidence of microbiologic contamination of blood cultures.
During interventional period we randomized patients into two groups: 1) educational intervention (Group 1) and 2) educational intervention plus port protector (Group 2).
We focused on CVC-related sepsis as primary outcome. Secondary outcomes were the rate of CVC colonization and CVC contamination.

Results: Eighty seven CVCs were included during observational period. CLABSIs rate was 8.4/1000 [10 sepsis (9 CLABSIs)]. We observed 17 CVC colonizations and 6 contaminations. Forty six CVCs were included during interventional period. CLABSIs rate was 1.4/1000. 21/46 CVCs were included into Group 2, in which no CLABSIs or contaminations were reported, while 2 CVC colonizations were found.

Conclusions: Our study clearly shows that both kinds of interventions significantly reduce the rate of CLABSIs. In particular, the use of port protector combined to educational interventions gave zero CLABSIs rate.

Trial registration: NCT03486093 [ClinicalTrials.gov Identifier], retrospectively registered.

Keywords: Venous central catheter, Central line-associated bloodstream infections, Port protector, Respiratory semi-intensive care unit

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SHEA

SHEA/IDSA/APIC Practice Recommendation

Strategies to prevent central line-associated bloodstream infections in acute-care hospitals: 2022 Update

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Additional Approaches

1. Use antiseptic- or antimicrobial-impregnated CVCs (Quality of Evidence: HIGH in adult patients[38,39,169–171] and Quality of Evidence: MODERATE in pediatric patients)[172,173]
2. Use antimicrobial lock therapy for long-term CVCs (Quality of Evidence: HIGH)[177–184]
3. Use recombinant tissue plasminogen activating factor (rt-PA) once weekly after hemodialysis in patients undergoing hemodialysis through a CVC (Quality of Evidence: HIGH)[192]
4. Utilize infusion or vascular access teams for reducing CLABSI rates (Quality of Evidence: LOW)[193,194]
5. Use antimicrobial ointments for hemodialysis catheter insertion sites (Quality of Evidence: HIGH)[197–201]
6. Use an antiseptic-containing hub/connector cap/port protector to cover connectors (Quality of Evidence: MODERATE)[202–208]

AGENDA

- PACK PROCEDURALI INSERIMENTO E GESTIONE
- TAUROLIDINA
- PORT PROTECTORS

- **FILTRI IN LINEA**

Editorial

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SAGE

WoCoVA consensus on the clinical use of in-line filtration during intravenous infusions: Current evidence and recommendations for future research

Ton Van Boxtel[1], Mauro Pittiruti[2], Annemarie Arkema[3], Patrick Ball[4], Giovanni Barone[5], Sergio Bertoglio[6], Roberto Biffi[7], Christian Dupont[8], Caroline Fonzo-Christe[9], Jann Foster[10], Matthew Jones[11], Cornelia Keck[12], Gillian Ray-Barruel[13], Michael Sasse[14], Giancarlo Scoppettuolo[2], Agnes Van Den Hoogen[15], Gianluca Villa[16], Lynn Hadaway[17], Marcia Ryder[18], Gregory Schears[19] and Josie Stone[20]

Abstract

The need for filtering intravenous infusions has long been recognized in the field of venous access, though hard scientific evidence about the actual indications for in-line filters has been scarce. In the last few years, several papers and a few clinical studies have raised again this issue, suggesting that the time has come for a proper definition of the type of filtration, of its potential benefit, and of its proper indications in clinical practice. The WoCoVA Foundation, whose goal is to increase the global awareness on the risk of intravenous access and on patients' safety, developed the project of a consensus on intravenous filtration. A panel of experts in different aspects of intravenous infusion was chosen to express the current state of knowledge about filtration and to indicate the direction of future research in this field. The present document reports the final conclusions of the panel.

Keywords

In-line filters, in-line filtration, filtering intravenous solutions, endotoxin, bacteria, particles, inert particles, microparticles, phlebitis, neonates, biofilm, drug incompatibility

Date received: 24 August 2020; accepted: 24 December 2020

Most current guidelines do not state the proper indication to use in-line filtration during IV administration of fluids. The most recent edition of the Infusion Nurses Society (INS) "Infusion therapy standards of practice" (2016)[1] is an exception as it clearly addresses the issue of filtration. According to the INS recommendations, filtration should be adopted when infusing parenteral nutrition solutions (0.2- or 1.2-micron filters, depending on the absence/presence of lipids), blood and blood components (170- to 260-micron filters) and medications withdrawn from glass ampoules (filter needles or filter straw); filtration is also recommended for intraspinal infusions (0.2-micron filters), which will not be discussed in this document. Regarding the potential indications for filtration in other situations, there is much more uncertainty. On the basis of a few clinical studies carried out in a pediatric intensive care unit,[2] INS standards suggest "considering" the use of 0.2- and 1.2-micron filters when infusing intravenous solutions in critically ill patients. On the other hand, on the basis of a 2010 review,[3] the routine use of in-line filtration for prevention of phlebitis related to peripheral IV cannulas is not recommended by INS.

There is growing evidence that in pediatric patients admitted to intensive care unit the use of in-line filters may reduce the incidence of SIRS, although this is not associated with a reduction in the incidence of sepsis.[56] In a prospective, randomized, controlled trial including 807 critically ill children, the use of in-line filtration reduced the composite endpoint of "severe complications" including sepsis, SIRS and organ failure. SIRS, length of stay and mechanical ventilation were also reduced as single events.[2,5] As described above, the same authors analyzed the effect of in-line filtration in a subgroup of cardiac patients comprising 305 children ($n = 150$ control, $n = 155$ filter group). Again, risk of SIRS (−11.3%; 95% CI −21.8 to −0.5%), renal (−10.0%; 95% CI −17.0 to −3.0%) and hematologic (−8.1%; 95% CI −14.2 to −0.2%) dysfunction were significantly decreased in the filter group. No risk differences were demonstrated for occurrence of sepsis, any other organ failure or dysfunctions between both groups.[2,5]

Regarding the newborn population admitted to Neonatal Intensive Care Unit the quality of evidence is very low. In the above quoted Cochrane review on neonates, the use of in-line filters compared with unfiltered fluids for intravenous infusion had no statistically significant difference in effectiveness on overall mortality (typical RR 0.87, 95% CI 0.52 to 1.47; typical RD −0.01, 95% CI −0.06 to 0.04; two studies, 530 infants), proven and suspected septicemia (typical RR 0.86, 95% CI 0.59 to 1.27; typical RD −0.02, 95% CI −0.09 to 0.04; two studies, 530 infants), or other secondary outcomes (including local phlebitis and thrombus, necrotizing enterocolitis, duration of cannula patency, length of stay in hospital, number of catheters inserted and financial costs). The incidence of SIRS was not considered.

Table 2. Summary of the conclusions of the panel.

(1) Evidence about possible harmful effects of inert particles in intravenous infusions

The types and dimensions of the potentially harmful particles are extremely variable. Particles <10–12 micron can be phagocytosed by macrophages and may potentially act by modifying cell activities. Particles >10–12 micron can occlude the microcirculation and may potentially be associated with local tissue damage, particularly in the lung. A great variety of pathological conditions has been potentially ascribed to the effect of particles, though most of the evidence is anecdotical.

Filters with 0.2 micron are expected to stop the vast majority of particles, including bacteria and air bubbles; 1.2-micron filters are used for removing lipid aggregates during administration of PN. Larger filters are unlikely to remove most of the potentially harmful particles.

Future studies should be designed to identify the occurrence of potentially particle-related complications in different groups of patients, with and without the implementation of in-line filtration, and preferentially – when ethically acceptable – under the structure of randomized controlled trials.

(2) Potential benefits of in-line filters in reducing peripheral phlebitis

Phlebitis is a very frequent complication of peripheral intravenous catheters, potentially provoked by many different causes (chemical, bacterial and mechanical) and with many different pathological features. It has been postulated that the mechanisms by which infused solutions may cause damage to the endothelium might include the presence of micro-particles contaminating the drug, or the accidental infusion of drug precipitates, or the accidental contamination of the infusion with endotoxin or bacteria. All of these items (inert particles, drug precipitates, endotoxin, bacteria, etc.) might be successfully removed by in-line filters.

The results of clinical studies dealing with the potential beneficial effect of in-line filters is overall uncertain and controversial. Though, some studies suggest that in-line filters may concur in reducing the risk of PIVC-related phlebitis.

Further randomized clinical studies are warranted, as long as designed properly, i.e. taking into account all the factors which are known to be cause of phlebitis, not only to confirm the beneficial effects of in-line filters, but also to describe potential disadvantages and to evaluate the final cost-effectiveness of their utilization in different patient populations.

(3) Potential benefits of in-line filters in reducing systemic inflammation/infection

The accurate pathogenesis of systemic infection is still largely unclear, though it appears that bacterial invasion may start a systemic inflammatory response, which – though probably finalized as a defense response – may imply obnoxious effects on circulation, respiration and organ function. At present, there is no clear and direct evidence that particles may be involved in this pathogenesis.

The available clinical evidence suggests that in-line filters may play a role in reducing systemic complications in the pediatric and neonatal populations, particularly in the critically ill or in children receiving PN. Though, data suggest some effects on the reduction of the incidence of SIRS and of organ failure, but not on mortality or on the incidence of sepsis.

More clinical studies are needed. Critical points in the design of future studies are: the proper identification of the patient population (neonates vs children), the type of treatment (PN solutions vs non-nutritional IV therapies), and the definition of the primary endpoint (organ failure; SIRS; systemic infection; mortality; etc.).

Section Six: Vascular Access Device Management

Section Standards

I. To ensure patient safety, the clinician is competent in vascular access device (VAD) management, including knowledge of relevant anatomy, physiology, and VAD management techniques aimed at maintaining vascular access and reducing the risk of complications.
II. Indications and protocols for VAD management are established in organizational policies, procedures, and/or practice guidelines and according to manufacturers' directions for use.

33. FILTRATION

Standard

33.1 Parenteral nutrition (PN) solutions are filtered using a 1.2-micron filter.
33.2 Blood and blood components are filtered using a filter appropriate for the prescribed component.
33.3 Intraspinal infusion solutions are filtered using a surfactant-free, particulate-retentive, and air-eliminating filter.
33.4 Medications in glass ampoules are withdrawn using a filter needle or filter straw (eg, 5 micron); medications are never administered through a filter needle.

Practice Recommendations

A. Use a filter only when the benefits outweigh the risks and according to the medication or solution and manufacturer's instructions (indications, contraindications, and filter type).[1-3] (III)
   1. While as yet poorly understood, filter risks include sorption of active or solution-stabilizing inactive ingredients onto the filter; leaching or extraction of filter components into the infusate; shedding of filter particles; elevated line pressure, which can mask infiltration or extravasation; shearing of liposomal globules; and increased risk of hypersensitivity reactions.[3-8] (III)
   2. Choose a filter that is compatible with the medication or solution (pore size, filter composition, electrical charge, and filter manufacturer), especially for small doses or medications with a narrow therapeutic index. Infusate filter compatibility data is an area of needed research. In the absence of compatibility information, consult with a pharmacist to determine an appropriate filter.[1,2,9,10] (IV)
   3. For protein-based medications, including biologic therapies, follow the manufacturer's directions for filtration (eg, should, should not, or may be filtered) to prevent immune system reactions or dose trapping.[2,9-11] (IV)

B. Use air-eliminating filters, unless otherwise contraindicated, for all infusions in patients with a medical diagnosis involving right-to-left cardiac or pulmonary shunting to reduce the amount of air and particulate matter that reaches the arterial circulation, also known as *paradoxical embolization*. The presence of microbubbles in the arterial system can also impede endothelial lining-mediated arterial contractility potentially through damage to endothelial lining or decreased perceived shear stress.[12,13] (III)
   1. A relative contraindication to filtration would be a small dose or narrow therapeutic index medication without filter infusate compatibility information.[2,10] (IV)

C. Consider filtration of solutions and medications in high-risk patients to reduce microemboli-mediated inflammation and microcirculation impairment resulting from administration of microbubbles of air (<1000 microns) or particles entrained in infusion solutions and medications. The patient populations most likely to benefit from particle and microbubble reduction have yet to be determined but might include neonates, critically ill patients, or those with tissue injury.[14,15] (II)
   1. Avoid routine, indiscriminate filtration in neonates. Use filtration when indicated by the infusate or by patient-specific risk factors (eg, right-to-left shunting).[16-18] (I)
   2. Consider the routine use of in-line filters outside a definitive indication in pediatric critical care patients for a potential protective effect against lung, renal, or hematologic dysfunction and systemic inflammatory response syndrome (SIRS).[19,20] (III)
   3. Avoid routine, indiscriminate use of filtration in adult critical care patients.[21,22] (III)

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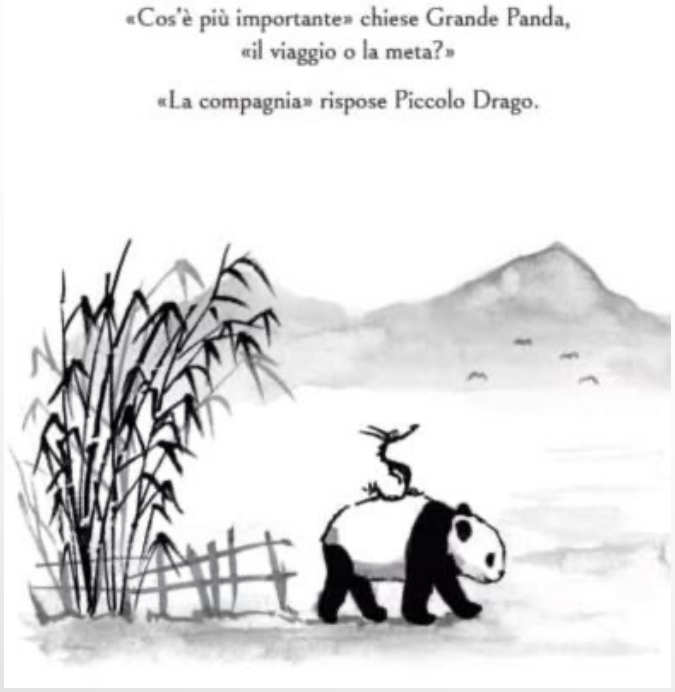
CONCLUSIONI

- I PACK PROCEDURALI PER IMPIANTO E GESTIONE DI DISPOSITIVI DI ACCESSO VASCOLARE POSSONO OGGI ESSERE CONSIDERATI, SIA PER I PAZIENTI ADULTI CHE PEDIATRICI E NEONATALI, UNO STANDARD CHE GARANTISCE RISPARMIO DI TEMPO, OTTIMIZZAZIONE DELL'USO DEI MATERIALI E AUMENTATA COMPLIANCE AI BUNDLES
- LA TAUROLIDINA E' AL MOMENTO IL LOCK DI RIFERIMENTO PER L'ANTIMICROBIAL LOCK THERAPY E PROPHYLAXIS NEI PAZIENTI CON CATETERI A LUNGO TERMINE. SONO NECESSARI STUDI CHE NE DEFINISCANO L'EFFICACIA E LA COSTO-EFFICACIA IN PAZIENTI OSPEDALIZZATI CON CATETERI A BREVE TERMINE
- L'UTILIZZO DEI PORT PROTECTORS PER LA DISINFEZIONE PASSIVA DEI NEEDLEFREE CONNECTORS È UNA STRATEGIA EFFICACE PER LA PREVENZIONE DELLA COLONIZZAZIONE PER VIA INTRALUMINALE, AUMENTANDO LA COMPLIANCE DEGLI OPERATORI ALLA MANOVRA DI DISINFEZIONE, STANDARDIZZANDO LA MANOVRA STESSA E DETERMINANDO UN RISPARMIO DI TEMPO
- RELATIVAMENTE AI FILTRI IN LINEA, PUR ESSENDOCI DELLE SEGNALAZIONI IN AMBITO PEDIATRICO E NEONATALE DI RIDUZIONE DI SIRS E FLEBITI, NON VI SONO DATI CHE INDICANO UNA RIDUZIONE DELLE SEPSI E DELLA MORTALITA'. PER TALE MOTIVO QUINDI ATTUALMENTE NON E' POSSIBILE RACCOMANDARNE L'USO A TALE FINE.



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GRAZIE PER L'ATTENZIONE!

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