ANIPIO
SOCIETÀ SCIENTIFICA NAZIONALE INFERMIERI SPECIALISTI DEL RISCHIO INFETTIVO

Infection control, oltre l'ospedale

Bari 20-21 settembre 2024

Jacopo Fiorini

Linee di indirizzo sugli accessi vascolari e prevenzione del rischio infettivo

La pratica clinica basata sulle evidenze scientifiche

"L'EBM è l'uso scrupoloso, esplicito e assennato delle migliori evidenze attuali nel prendere una decisione riguardo alla cura del paziente individuale" (Sackett DL et al., BMJ 1996;312:71-2)

Le evidenze vanno estratte dal meglio della letteratura scientifica corrente, ed usate in modo consapevole, non applicate meccanicamente

La EBP si contrappone alla pratica basata esclusivamente sull'opinione e sull'esperienza personale

Si è sempre fatto così

L'evidence based practice

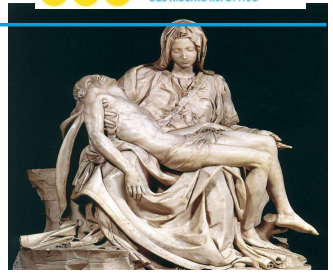
Obiettivo finale della EBP è sempre l'assistenza al paziente individuale: i dati reperiti in letteratura vanno quindi ricalibrati costantemente rispetto al paziente (bisogni assistenziali, condizioni cliniche, preferenze).

"La pratica dell'EBM implica l'integrazione dell'esperienza clinica individuale con la miglior evidenza clinica esterna disponibile proveniente dalla ricerca sistematica"

EBP: un processo sistematico e di qualità

1. Impostazione del quesito clinico
2. Ricerca bibliografica
3. Valutazione critica
4. Incorporazione delle evidenze nella pratica clinica

La ricerca della Letteratura



Il quesito di ricerca

Le parole chiave

La Letteratura

La pratica

Il paziente

Dalla Teoria alla Pratica

Dove reperire le fonti EBP?

convegno triennale anipio

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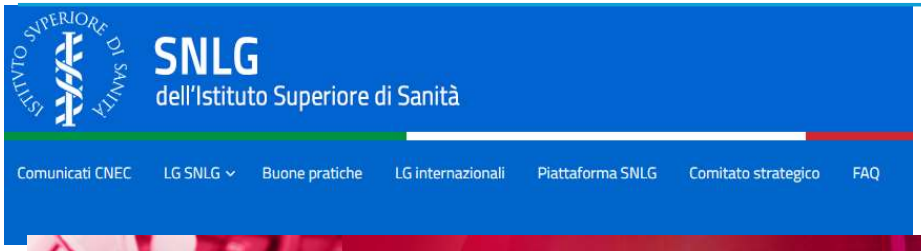
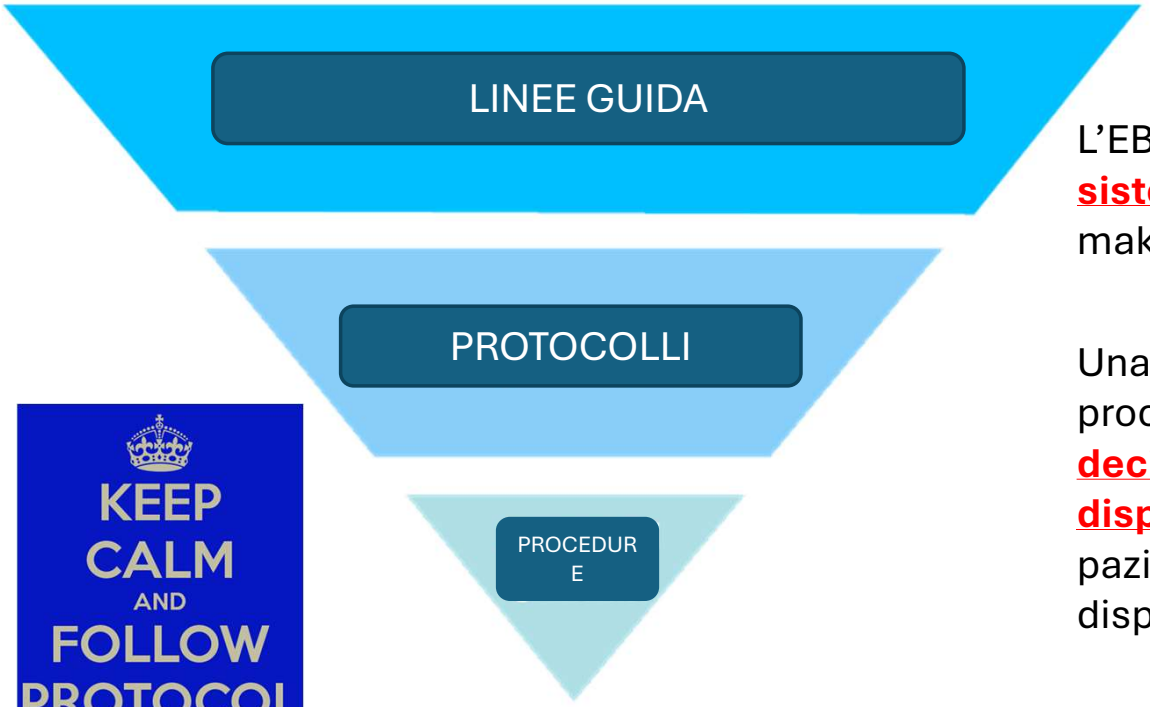


PROFESSIONI INFERMIERISTICHE

EBP E EBN



L'EBP è **uno strumento per contrastare gli errori sistematici** che nascono da un processo di decision making perché **si fonda su evidenze scientifiche**

Una declinazione dell'**EBP** è rappresentata dall'**EBN**, un processo per mezzo del quale **gli infermieri assumono le decisioni cliniche utilizzando le migliori ricerche disponibili**, la loro esperienza clinica e le preferenze del paziente all'interno di un determinato contesto di risorse disponibili

(Saunders et al., 2019)

Cosa dicono le evidenze scientifiche sugli accessi vascolari e in merito al rischio infettivo?

Impatto delle CABSI

USA: 500000 VAD infetti/anno

Europa: 4 mln soggetti/anno

- Ospedalizzazione prolungata: 11-23 giorni in più;
- Costi sanitari elevatissimi 33-35000$ ad episodio/ 16 mln di giornate di ricovero;
- Aumento del Tasso di mortalità: attribuibile alle CABSI 12-25%
  - Europa 37000 decessi

Cause infezioni sistemiche CABSI

60%

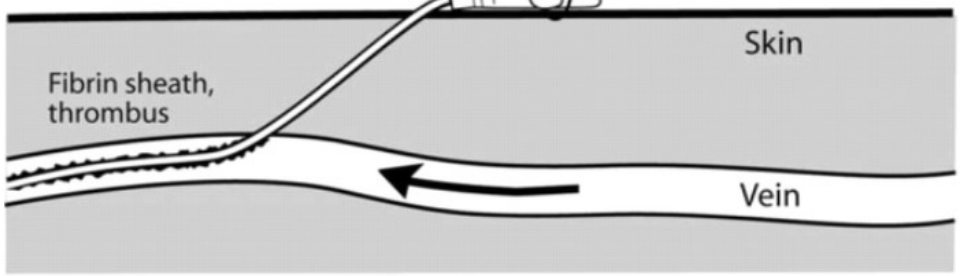
Contaminated catheter hub
Endogenous
Skin flora
Extrinsic
HCW hands

Contaminated infusate
Extrinsic
Fluid
Medication
Intrinsic
Manufacturer

<1%

12%

Skin organisms
Endogenous
Skin flora
Extrinsic
HCW hands
Contaminated disinfectant



Hematogenous
from distant infection

Durante la procedura di posizionamento

Fattori di rischio per CABSI

Fattori di rischio intrinseci

- ❑Età
- ❑Comorbidità
- ❑Condizioni generali
- ❑Sesso
- ❑Immunosoppressione

Fattori di rischio estrinseci

- ❑Ospedalizzazione prolungata prima del posizionamento VAD
- ❑NPT
- ❑VAD multilume
- ❑Sede VAD
- ❑Presenza di più VAD
- ❑Posizionamento del VAD in area critica
- ❑ESTERNALIZZAZIONE VAD

Rischio infettivo

Journal of Hospital Infection

Volume 72, Issue 2, June 2009, Pages 97–103

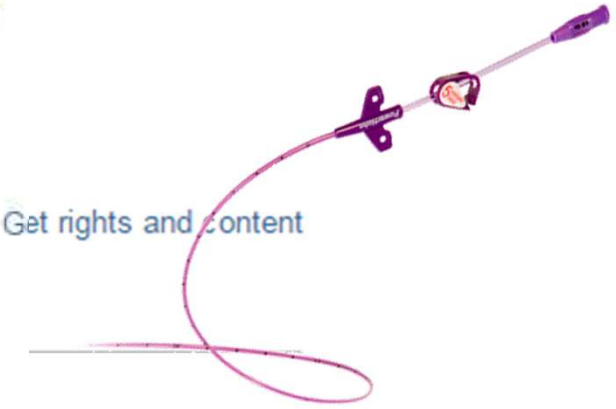
Review

Epidemiology, medical outcomes and costs of catheter-related bloodstream infections in intensive care units of four European countries: literature- and registry-based estimates

E. Tacconelli[a], G. Smith[b], K. Hieke[c], A. Lafuma[d], P. Bastide[e]

Show more

https://doi.org/10.1016/j.jhin.2008.12.012



Rischio infettivo

Table 1.
Key results for the four European countries

	France	Germany	Italy	UK
Total population 2005[a] (millions)	60.2	82.5	57.5	59.8
No. of implanted central venous and arterial catheters in ICUs	1 000 000	1 750 000	490 000	210 000
Incidence rate of CRBSIs (per 1000 catheter days)	1.23	1.5	2.0	4.2
No. of CRBSIs per year	14 400	8400	8500	8940
Estimate of mortality related to CRBSI	1580	1000–1300	1500	NA
Additional LOS per CRBSI episode (in days)	9.5–14	4.8–7.2 (modelled)	12.7	1.9–4.0 (modelled)
No. of ICU days due to CRBSIs per year	136 700–201 475	40 000–60 000	109 220	15 960–33 600
Additional cost per CRBSI episode	€7,730–€11,380	€4,200	€13,030	£2,949–£6,209 (€4,392–€9,251)
Annual costs related to CRBSIs (€ million) for the healthcare systems	100.0–130.0	59.6–78.1	81.6	£19.1–£36.2 (€28.5–€53.9)

Rischio infettivo

convegno triennale anipio

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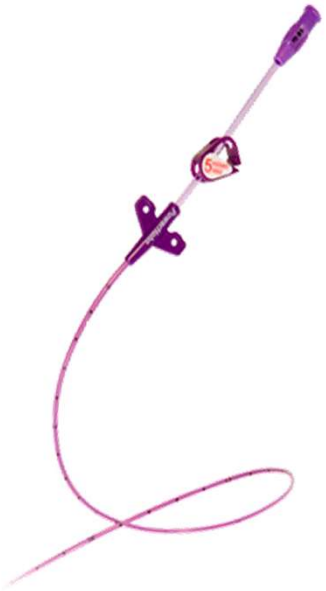

8500 episodi di CR-BSI / anno

1500 decessi correlati a CR-BSI

12,7 gg in più di ricovero per episodio di CR-BSI

13.030 € per episodio di CR-BSI

Euro 81,6 milioni anno

LE CABSI

e i diversi tipi di dispositivi vascolari

Device	No. of prospective studies	No. of device-related BSIs: Per 100 catheters, Pooled mean	Per 100 catheters, 95% CI	Per 1000 catheter-days, Pooled mean	Per 1000 catheter-days, 95% CI
Peripheral venous catheter	13	0.2	0.1–0.3	0.6	0.3–1.2
Arterial catheter	6	1.5	0.9–2.4	2.9	1.8–4.5
Short-term, nonmedicated CVC	61	3.3	3.3–4.0	2.3	2.0–2.4
Pulmonary-artery catheter	12	1.9	1.1–2.5	5.5	3.2–12.4
Hemodialysis catheter					
Noncuffed	15	16.2	13.5–18.3	2.8	2.3–3.1
Cuffed	6	6.3	4.2–9.2	1.1	0.7–1.6
Peripherally inserted central catheter	8	1.2	0.5–2.2	0.4	0.2–0.7
Long-term tunneled and cuffed CVC	18	20.9	18.2–21.9	1.2	1.0–1.3
Subcutaneous central venous port	13	5.1	4.0–6.3	0.2	0.1–0.2

NOTE. Adapted from Kluger and Maki [8] based on 206 published prospective studies in which every device was evaluated for infection. CVC, central venous catheter.

Esiste un device vascolare con un minor rischio infettivo?

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Predictors and Prevalence of Central Line Associated Blood Stream Infections Among Adult Patients in Critical Care Units -Kenyatta National Hospital

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Abstract: Most adult patients admitted in Critical Care Units (CCUs) have central venous catheters (CVCs). These catheters mostly remain in place for the entire period of hospitalization, hence the risk of developing Central Line Associated Bloodstream Infection (CLABSI). The burden of CLABSI has remained high despite the introduction of CLABSI care bundles increasing the morbidity, mortality, hospital stay and cost. Most CLABSIs are caused by factors attributed to patient characteristics, clinical care and institutional factors. The aim of this study was to determine the prevalence and predictors of CLABSIs among critically ill adult patients at CCUs of Kenyatta National Hospital. The study applied a cross-sectional descriptive design with stratified sampling and simple random sampling for each stratum. 86critical care nurses were selected from a total of 110 nurses using Yamane formulae. Medical records of critically ill patients' that met the inclusion criteria were reviewed for the year 2015. An interviewee administered questionnaire and observation checklist were used to collect data from the nurses, and a data collection sheet was used to collect data from the medical records on prevalence of CLABSIs and patient characteristics. Descriptive statistics was used to summarize the data and inferential statistics (Chi-square test, Pearsons' correlation) was used to establish relationships between variables. Data analysis was done using the Statistical Package for Social Sciences (SPSS) version 21.0. This study revealed that the prevalence of CLABSIs was 3.53%. Stepwise logistic regression revealed that, the patient predictors of CLABSIs in KNH CCUs were as follows; Neurological disorders as the underlying disease $X^2(52) = 15.249$; 95% CI -0.199-0.158; P=0.946, increased length of hospitalization with CVC in situ $X^2(52) = 40.639$; 95% CI 0.612-0.874; P< 0.001 and parenteral nutrition use $X^2(52) = 9.826$; 95% CI 0.041-0.759; P=0.013. In addition, the nursing care related factors that predispose critically ill patients to CLABSIs in KNH CCUs were; Poor practices on hand hygiene before manipulation of infusion line which was observed in 81.8% of the CCNs, failure to remove unnecessary CVCs promptly, poor knowledge and practices on CVC maintenance and inadequate knowledge and outdated

Keywords: Central Line Associated Bloodstream Infection (CLABSI), Prevalence, Predictors, Critical Care Units (CCUs),

- Maggiore è la permanenza in sede del CVC e maggiore è la probabilità di infezione, a partire da 8 giorni dopo il posizionamento.
- Realtà indagate in cui è presente solo iodiopovidone (la clorexidina al 2% riduce il rischio di CLABSI del 50% rispetto allo iodiopovidone).
- 4,8% dei giorni in situ dei CVC non erano necessari.

RESEARCH ARTICLE Open Access

Peripheral venous catheter-related bloodstream infection is associated with severe complications and potential death: a retrospective observational study

Akihiro Sato[1,2], Itaru Nakamura[1*], Hiroaki Fujita[1,3], Ayaka Tsukimori[1,3], Takehito Kobayashi[1,3], Shinji Fukushima[1], Takeshi Fujii[2] and Tetsuya Matsumoto[3]

Abstract

Background: The purpose of this study was to identify the clinical characteristics and outcomes of peripheral vascular catheter-related bloodstream infections (PVC-BSIs) and determine the risk of severe complications or death.

Methods: We performed a retrospective observational study from June 2010 to April 2015 at two regional university-affiliated hospitals in Tokyo. We studied the clinical manifestations, underlying diseases, laboratory results, treatment methods, recurrence rates, and complications in 62 hospitalized patients diagnosed with PVC-BSIs by positive blood cultures.

Results: The median time from admission to bacteremia was 17 days (range, 3–142 days) and that from catheter insertion to bacteremia diagnosis was 6 days (range, 2–15 days). Catheter insertion sites were in the arm in 48 (77.4%) patients, in the foot in 3 (4.8%) patients, and in an unrecorded location in 11 (17.7%) patients. Additionally, the causative pathogens were Gram-positive microorganisms in 58.0% of cases, Gram-negative microorganisms in 35.8% of cases, Candida spp. in 6.2% of cases, and polymicrobials in 25.8% of cases. Eight (12.9%) patients died within 30 days of their blood culture becoming positive. Patients who died of PVC-BSIs had a higher proportion of *Staphylococcus aureus* infection than patients who survived (odds ratio, 8.33; $p = 0.004$).

Conclusions: PVC-BSIs are a significant cause of health care-associated infection. We observed cases of severe PVC-BSI requiring intensive and long-term care along with lengthy durations of antibiotic treatment due to hematogenous complications, and some patients died. For patients with PVC-BSIs, *S. aureus* bacteremia remains a major problem that may influence the prognosis.

atheter-related bloodstream infection, Sepsis,

Il tempo medio tra il ricovero e la batteriemia è di 17gg.

58,0% Gram +
35,8% Gram –
6,2% Candida

25,8% casi è presente più di un patogene

Lo Stafilococco Aureo è il patogeno più comune per PVC che ha causato la morte del paziente

GAVeCeLT
Gli Accessi Venosi Centrali a Lungo Termine

RACCOMANDAZIONI GAVeCeLT 2021
PER LA INDICAZIONE, L'IMPIANTO E LA GESTIONE DEI DISPOSITIVI PER ACCESSO VENOSO

Infusion Therapy Standards of Practice

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Lisa Gorski, MS, RN, HHCNS-BC, CRNI®, FAAN
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GUIDELINES

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Adoption and application in Italy of the principal guidelines and international recommendations on venous access

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Infection Control & Hospital Epidemiology (2022), 43, 553-569
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SHEA

SHEA/IDSA/APIC Practice Recommendation

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

Niccolò Buetti MD, MSc, PhD[1,2,a], Jonas Marschall MD, MSc[3,4,a], Marci Drees MD, MS[5,6], Mohamad G. Fakih MD, MPH[7], Lynn Hadaway MEd, RN, NPD-BC, CRNI[8], Lisa L. Maragakis MD, MPH[9], Elizabeth Monsees PhD, MBA, RN, CIC[10,11], Shannon Novosad MD MPH[12], Naomi P. O'Grady MD[13], Mark E. Rupp MD[14], Joshua Wolf MBBS, PhD, FRACP[15,16], Deborah Yokoe MD, MPH[17] and Leonard A. Mermel DO, ScM[18,19]

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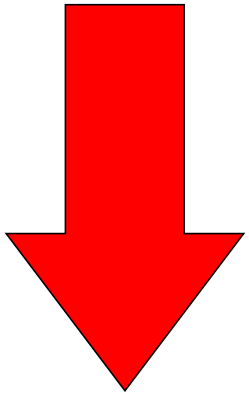
Purpose

Previously published guidelines provide comprehensive recommendations for detecting and preventing healthcare-associated infections (HAIs). The intent of this document is to highlight practical recommendations in a concise format designed to assist acute-care hospitals in implementing and prioritizing their central line-associated bloodstream infection (CLABSI) prevention efforts. This document updates the *Strategies to Prevent Central Line-Associated Bloodstream Infections in Acute-Care Hospitals* published in 2014.[1] This expert guidance document is sponsored by the Society for Healthcare Epidemiology of

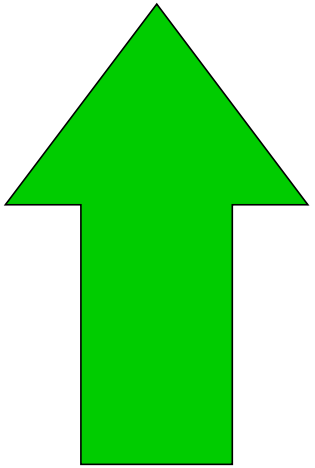
Update,[1] including recommendations that have been added, removed, or altered. Recommendations are categorized as essential practices that should be adopted by all acute-care hospitals (in 2014 these were "basic practices," renamed to highlight their importance as foundational for hospitals' HAI prevention programs) or additional approaches that can be considered for use in locations and/or populations within hospitals when CLABSIs are not controlled after implementation of essential practices (in 2014 these were "special approaches"). See Table 1 for a complete summary of the recommendations contained in this document.

Obiettivo Targeting Zero



Azzerare le complicanze

Perseguire il miglior risultato possibile



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Society for Healthcare Epidemiology of America

Burden of outcomes associated with hospital-acquired CLABSI

1. Increased length of hospital stay[3–6]
2. Increased cost. The adjusted variable costs for patients with CLABSI were $32,000 (2010 US dollars) higher on average than for patients without CLABSI[7]
3. Increased morbidity and mortality[8]

Infrastructure requirements

Facilities undertaking CLABSI interventions should have the following elements in place:

1. An adequately staffed infection prevention and control program responsible for identifying patients who meet the surveillance definition for CLABSI.
2. Infection prevention staff and, preferably, information technology support to collect and calculate catheter days as a denominator when computing rates of CLABSI and patient days to allow calculation of CVC utilization. Catheter days from information systems should be validated against a manual method, with a margin of error no greater than ±5%.[60–62]

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SHEA/IDSA/APIC Practice Recommendation

Strategies to prevent central line-associated bloodstream infections

Table 1. Summary of Recommendations to Prevent CLABSI

Evidenze di qualità ELEVATA

Evidenze di qualità Moderata

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]

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SHEA/IDSA/APIC Practice Recommendation

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Evidenze di qualità ELEVATA

Evidenze di qualità Moderata

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]

Approaches that Should Not Be Considered a Routine Part of CLABSI Prevention

1. Do not use antimicrobial prophylaxis for short-term or tunneled catheter insertion or while catheters are *in situ* (Quality of Evidence: HIGH)[209–213]
2. Do not routinely replace CVCs or arterial catheters (Quality of Evidence: HIGH)[214]

Unresolved Issues

1. Routine use of needleless connectors as a CLABSI prevention strategy before an assessment of risks, benefits, and education regarding proper use[215–219]
2. Surveillance of other types of catheters (eg, peripheral arterial or peripheral venous catheters)[11,21,22]
3. Standard, nonantimicrobial transparent dressings and CLABSI risk.
4. The impact of using chlorhexidine-based products on bacterial resistance to chlorhexidine
5. Sutureless securement
6. Impact of silver zeolite-impregnated umbilical catheters in preterm infants (applicable in countries where it is approved for use in children)[227]
7. Necessity of mechanical disinfection of a catheter hub, needleless connector, and injection port before accessing the catheter when antiseptic-containing caps are being used

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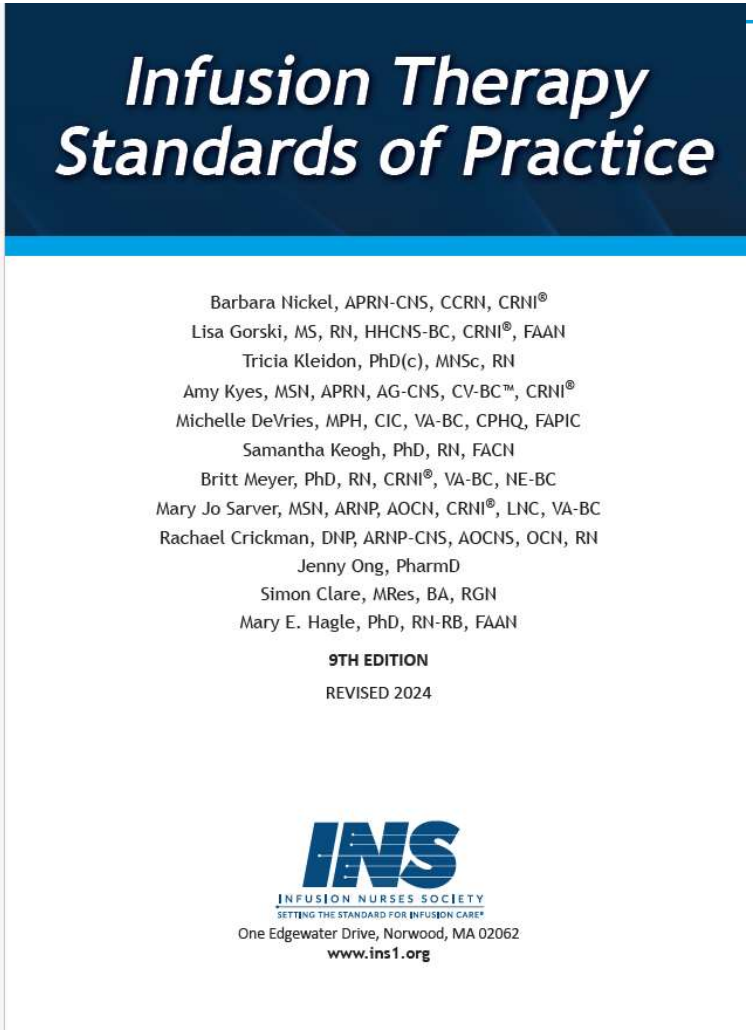
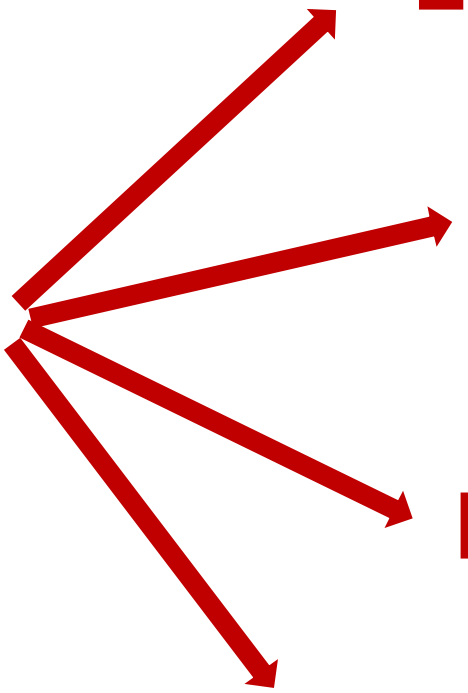
Assessing Compliance According to Practice	
Use of proper CVC insertion interventions: 1. Hand hygiene 2. Use of maximal sterile barrier precautions 3. Use of chlorhexidine-based cutaneous antisepsis	(Number of CVC insertions that have documented the use of all 3 interventions performed at the time of CVC insertion divided by number of all CVC insertions) ×100 = % properly performed procedures
Documentation of daily assessment regarding patient's need for continuing CVC access	(Number of CVC insertions with documentation of daily assessment divided by number of patients with CVC) ×100 = % of patients who received daily assessment for continuing need for CVC access
Assessing Compliance by Simulation	
Simulation of catheter maintenance to assess HCP competency	(Number of HCP properly simulating aseptic infusion of medications divided by number of HCP simulating the aseptic infusion of medications) ×100 = % of HCP competent in catheter maintenance
Assessing Device Utilization as a Surrogate for Patient Exposure Risk	
Standard utilization ratio (SUR)	Number of observed device days divided by number of predicted device days



- Vascular Access Team (VAT) is recognized for reduction complications and catheter-associated bloodstream infections (CABSI) in acute care hospitals.[1-18] (II)
- VAT reduces the use of peripheral to more invasive CVADs through clinical consultation; reduce costs associated with device-related complications, labor resources, and vascular access supplies and equipment; and improve patient satisfaction with greater first-attempt insertion success and lower rates of complications.[2,4,9,10,19-25] (II)
- Establish methods to communicate between acute care and community care organizations. Provide details of the specific type and management of VADs and the type and methods of delivery for the infusion therapy required to enhance care by alternative care organizations. (IV)
- Avoid insertion of a PIVC or midline catheter as a central line-associated bloodstream infection (CLABSI) prevention strategy when central venous access is indicated. (Committee Consensus)
- Use commercially manufactured prefilled flush syringes (when available) to reduce the risk of catheter-associated bloodstream infection (CABSI) and device failure, save time for syringe preparation, and aid optimal flushing technique and objectives.3-8 (II)

Strategie prevenzione CABSI



Engage champion and leader to support CLABSI reduction initiatives.

Educate

To Appropriate Use of full barrier precautions and daily evaluation of the necessity of the device.

Execute

Assessment and documentation competency of each professionals performing VAD insertion and maintenance procedures

Evaluate process and outcome measurement

Take Home Message

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