



DIAGNOSI DI INFEZIONE MEDIANTE DTP E INDICAZIONI ALLA RIMOZIONE DEL DISPOSITIVO

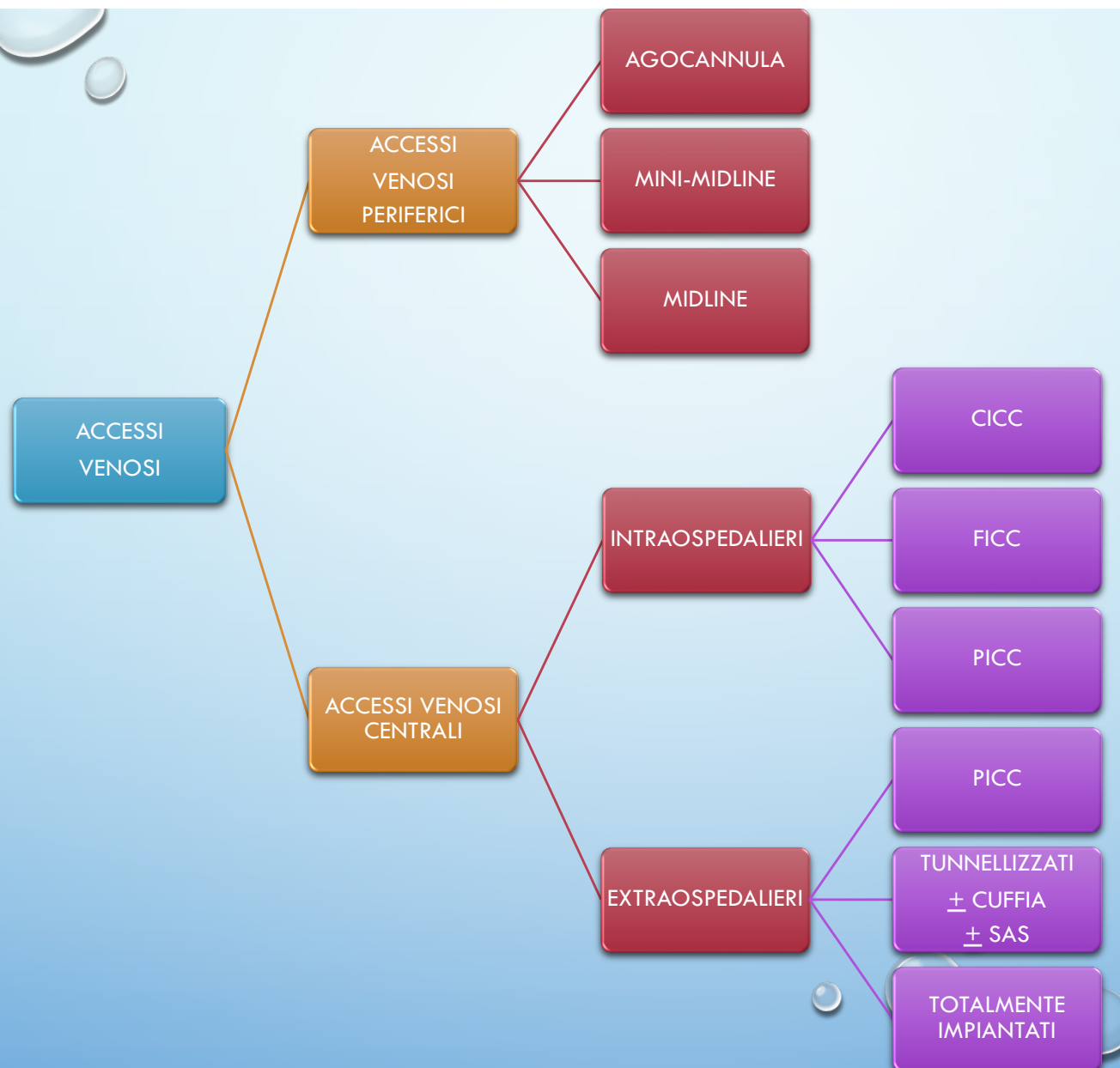
GIANCARLO SCOPPETTUOLO

CLINICA DELLE MALATTIE INFETTIVE

DIPARTIMENTO DI SCIENZE INFETTIVOLOGICHE E DI LABORATORIO

FONDAZIONE POLICLINICO UNIVERSITARIO A. GEMELLI - ROMA







**Scelta del dispositivo per accesso venoso
nel neonato**

Neonato

Necessità di accesso venoso alla nascita

Non indicazione al CVO



Accesso venoso periferico



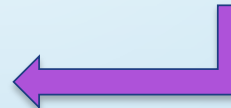
Cannula periferica corta

Indicazione al CVO

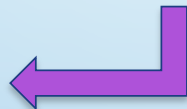


CVO monolume o bilume per 7 giorni

Dopo 7 giorni



Neonato stabile



Neonato acuto-grave



CICC o FICC ecoguidato



< 7 giorni	:	cannula periferica corta
7-14 giorni	:	catetere epicutaneo-cavale
> 14 giorni	:	CICC o FICC ecoguidato

Neonato

Necessità di accesso venoso dopo la nascita (> 24h)

Neonato stabile a termine



< 7 giorni	:	cannula periferica corta
> 7 giorni	:	catetere epicutaneo- cavale

Neonato stabile prematuro



< 7 giorni	:	cannula periferica corta
7-14 giorni	:	catetere epicutaneo-cavale
> 14 giorni	:	CICC o FICC ecoguidato

Neonato acuto-grave



CICC o FICC ecoguidato

PRIMA TENTAZIONE DEL MEDICO....

- ATTRIBUIRE IMMEDIATAMENTE LA RESPONSABILITA' DELLA FEBBRE AL CV, ANCORA PRIMA DI AVERE ESEGUITO ALCUNA INDAGINE DIAGNOSTICA
 - SOPRATTUTTO NEL PAZIENTE OSPEDALIZZATO (MA ANCHE NEL PAZIENTE DOMICILIARE) IL CV **È SOLO UNA DELLE POSSIBILI CAUSE DI INFEZIONE**
- RIMUOVERE IL CATETERE VASCOLARE
 - IN LETTERATURA È BEN DESCRITTO CHE CIRCA IL 70% DEI CVC RIMOSI SOLO CON CRITERIO EMPIRICO NON HANNO RAGIONE DI ESSERE RIMOSI
 - CRITERI PER LA RIMOZIONE IMMEDIATA DI UN CATETERE VASCOLARE? SÌ, MA IN CASI SELEZIONATI
- RICHIEDERE SUBITO DOPO LA RIMOZIONE IL POSIZIONAMENTO DI UN NUOVO CATETERE...

Unnecessary Removal of Central Venous Catheters in Cancer Patients with Bloodstream Infections

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Issam Raad, MD¹

We evaluated the rate of central venous catheter (CVC) removal in 283 cancer patients with bloodstream infections (BSIs). Removal of CVCs occurred unnecessarily in 57% of patients with non-central-line-associated BSI (non-CLABSI), which was equivalent to the rate of CVC removal in patients with CLABSI. Physician education and safe interventions to salvage the vascular access are warranted.

Infect Control Hosp Epidemiol 2018;1–4

from our institutional review board and a waiver of informed consent was obtained.

Statistical Analysis

Descriptive statistics were used to summarize patients' demographics and clinical characteristics.

The χ^2 or Fisher exact tests were used to compare categorical variables, as appropriate. Continuous variables were compared using Wilcoxon rank-sum tests because of the data's deviation from normal distribution. All tests were 2-sided, and statistical significance was set at *P*-value of .05. The statistical analyses were performed using R statistical software (version 3.2.1; R Foundation for Statistical Computing, Vienna, Austria).

RESULTS

We identified 283 patients who had a CVC and had simultaneous blood cultures drawn from the CVC and the peripheral

RESEARCH

Open Access

Should central venous catheter be systematically removed in patients with suspected catheter related infection?

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and Working Group on Catheter Related Infection Suspicion Management of GTEIS/SEMICUYC

Abstract

Introduction: Best clinical practice for patients with suspected catheter-related infection (CRI) remains unclear according to the latest Infectious Diseases Society of America (IDSA) guidelines. Thus, the objective of this study was to analyze clinical practice concerning the central venous catheter (CVC) and its impact on prognosis in patients with suspected CRI.

Methods: We performed a prospective, multicenter, observational study in 18 Spanish Intensive Care Units (ICUs). Inclusion criteria were patients with CVC and suspected CRI. The following exclusion criteria were used: age less than 18 years; pregnancy; lactation; human immunodeficiency virus; neutropenia; solid or haematological tumor; immunosuppressive or radiation therapy; transplanted organ; intravascular foreign body; haemodynamic instability; suppuration or frank erythema/induration at the insertion site of the CVC, and patients with bacteremia or fungemia. The end-point of the study was mortality at 30 days of CRI suspicion.

Results: The study included 384 patients. In 214 (55.8%) patients, CVC was removed at the moment of CRI suspicion, in 114 (29.7%) CVC was removed later and in 56 (14.6%) CVC was not removed. We did not find significant differences between survivors ($n = 311$) and non-survivors ($n = 73$) at 30 days according to CVC decision ($P = 0.26$). The rate of confirmed catheter-related bloodstream infection (CRBSI) was higher in survivors than in non-survivors (14.5% versus 4.1%; $P = 0.02$). Mortality rate was lower in patients with CRBSI than in the group of patients whose clinical symptoms were due to other causes (3/48 (6.25%) versus 70/336 (20.8%); $P = 0.02$). We did not find significant differences in mortality in patients with confirmed CRBSI according to CVC removal at the moment of CRI suspicion ($n = 38$) or later ($n = 10$) (7.9% versus 0; $P = 0.99$).

Conclusion: In patients with suspected CRI, immediate CVC removal may be not necessary in all patients. Other aspects should be taken into account in the decision-making, such as vascular accessibility, the risk of mechanical complications during new cannulation that may be life-threatening, and the possibility that the CVC may not be the origin of the suspected CRI.

Clinical Practice Guidelines for the Diagnosis and Management of Intravascular Catheter-Related Infection: 2009 Update by the Infectious Diseases Society of America

Leonard A. Mermel,¹ Michael Allon,² Emilio Bouza,⁹ Donald E. Craven,³ Patricia Flynn,⁴ Naomi P. O'Grady,⁵ Issam I. Raad,⁶ Bart J. A. Rijnders,¹⁰ Robert J. Sherertz,⁷ and David K. Warren⁸

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medicina *intensiva*

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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)[☆]



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DIFFICOLTÀ DIAGNOSTICHE

- CRITERI CLINICI (FEBBRE, BRIVIDI...) ASSOLUTAMENTE POCO SPECIFICI
- CLINICA ESTREMAMENTE POLIMORFA (FEBBRE ISOLATA CON CARATTERISTICHE VARIABILI FINO A SEPSI E SHOCK SETTICO)
- SEGNI LOCALI DI INFEZIONE MOLTO SPECIFICI MA POCO SENSIBILI

DIFFICOLTÀ DIAGNOSTICHE

- DIFFERENTI TESTS DI LABORATORIO, CON DIVERSA SENSIBILITÀ E SPECIFICITÀ

CLABSI/LCBSI E CRBSI

Table 1.

Two definitions of central venous catheter-related bloodstream infections

Bloodstream infection	Definitions
Catheter-related bloodstream infection	Clinical signs of sepsis and positive peripheral blood culture in the absence of an obvious source other than CVC with one of the following: Positive semiquantitative (>15 CFU) or quantitative ($>10^3$ CFU) culture from a part of the catheter with the same organisms isolated peripherally Simultaneous quantitative blood cultures with a ratio of $\geq 3:1$ (CVC vs. peripheral) Time difference of ≤ 2 hours leading to culture positive between CVC and peripheral cultures
Central line-associated bloodstream infection	Primary bloodstream infection in a patient who had a central line within the 48 hours period before development of infection Infection must not be related to an alternative cause

CVC, central venous catheter; CFU, colony forming unit.

Adapted from Bell T, et al. Infect Dis Clin North Am 2017;31:551-9, with permission of Elsevier. [3]

- Throughout the toolkit and monograph, the term used for intravascular catheter-related infections is CLABSI. Two terms, used to describe intravascular catheter-related infections, central line–associated bloodstream infection (CLABSI) and catheter-related bloodstream infection (CRBSI), should be distinguished in the following way^{7,8}:
 - CLABSI is the term used by the US Centers for Disease Control and Prevention’s (CDC’s) National Healthcare Safety Network (NHSN)⁹ (see [NHSN CLABSI information](#)). A CLABSI is a primary bloodstream infection (that is, there is no apparent infection at another site) that develops in a patient with a central line in place within the 48-hour period before onset of the bloodstream infection that is not related to infection at another site. Culturing the catheter tip or peripheral blood is not a criterion for CLABSI.
 - CRBSI is a more rigorous diagnostic definition and requires specific laboratory testing to identify the catheter as the source of the bloodstream infection, such as culturing the catheter tip or a more elaborate method such as differential time-to-positivity of blood cultures.

LCBI 1

LCBI 1 If LCBI 1 criterion is met, consider MBI-LCBI 1	Patient of any age has a recognized bacterial or fungal pathogen, not included on the NHSN common commensal list: 1. Identified from one or more blood specimens obtained by a culture OR 2. Identified to the genus or species level by non-culture based microbiologic testing (NCT)* methods (for example, T2 Magnetic Resonance [T2MR] or Karius Test). Note: <i>If blood is collected for culture within 2 days before, or 1 day after the NCT, disregard the result of the NCT and use only the result of the CULTURE to make an LCBI surveillance determination. If no blood is collected for culture within this time period, use the result of the NCT for LCBI surveillance determination.</i> AND Organism(s) identified in blood is not related to an infection at another site (See Appendix B: Secondary BSI Guide). *For the purposes of meeting LCBI-1, NCT is defined as a methodology that identifies an organism directly from a blood specimen without inoculation of the blood specimen to any culture media. For instance, NCT does not include identification by PCR of an organism grown in a blood culture bottle or any other culture media.
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LCBI 2 (all ages)

LCBI 2 If LCBI 2 criterion is met, consider MBI-LCBI 2	Patient of any age has at least <u>one</u> of the following signs or symptoms: fever (>38.0°C), chills, or hypotension AND Organism(s) identified in blood is not related to an infection at another site (See Appendix B: Secondary BSI Guide). AND The same NHSN common commensal is identified by a culture from two or more blood specimens collected on separate occasions (see Blood Specimen Collection). Common Commensal organisms include, but are not limited to, diphtheroids (<i>Corynebacterium</i> spp. not <i>C. diphtheria</i>), <i>Bacillus</i> spp. (not <i>B. anthracis</i>), <i>Propionibacterium</i> spp., coagulase-negative staphylococci (including <i>S. epidermidis</i>), viridans group streptococci, <i>Aerococcus</i> spp. <i>Micrococcus</i> spp. and <i>Rhodococcus</i> spp. For a full list of common commensals, see the Common Commensal tab of the NHSN Organisms List.
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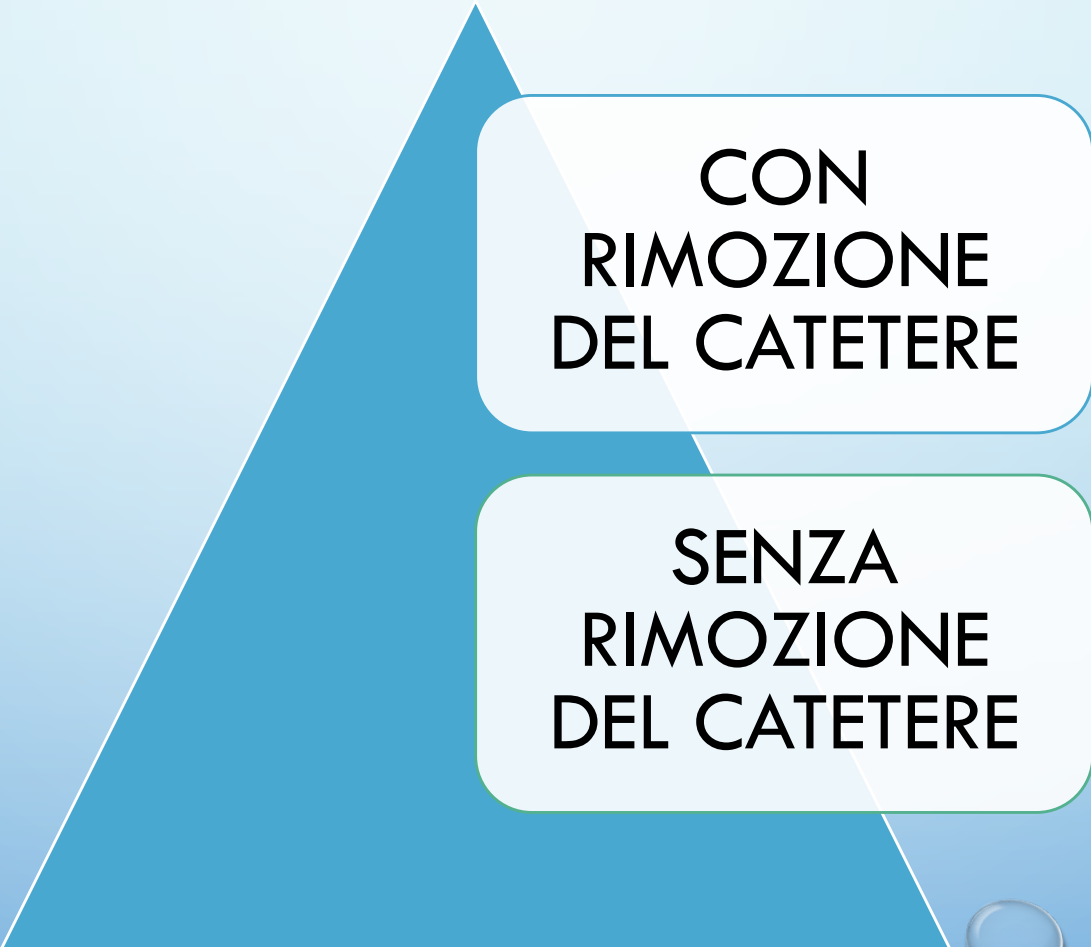
LCBI 3 (Patients $\leq$ 1 Year Old)

LCBI 3 If LCBI 3 criterion is met, consider MBI-LCBI 3	Patient $\leq$ 1 year of age has at least one of the following signs or symptoms: fever ($>38.0^{\circ}\text{C}$), hypothermia ($<36.0^{\circ}\text{C}$), apnea, or bradycardia AND Organism(s) identified in blood is not related to an infection at another site (See Appendix B: Secondary BSI Guide). AND The same NHSN common commensal is identified by a culture from two or more blood specimens collected on separate occasions (see Blood Specimen Collection). Common Commensal organisms include, but are not limited to, diphtheroids (<i>Corynebacterium</i> spp. not <i>C. diphtheria</i>), <i>Bacillus</i> spp. (not <i>B. anthracis</i>), <i>Propionibacterium</i> spp., coagulase-negative staphylococci (including <i>S. epidermidis</i>), viridans group streptococci, <i>Aerococcus</i> spp. <i>Micrococcus</i> spp. and <i>Rhodococcus</i> spp. For a full list of common commensals, see the Common Commensal tab of the NHSN Organisms List.
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Mucosal Barrier Injury LCBI (MBI-LCBI)

MBI-LCBI 1	MBI-LCBI-2	MBI-LCBI 3
Patient of any age fully meets LCBI 1 criterion	Patient of any age fully meets LCBI 2 criterion	Patient ≤ 1 year of age fully meets LCBI 3 criterion
with at least one blood specimen	with at least two matching blood specimens	
with ONLY intestinal organisms from the NHSN MBI organism list*	with ONLY Viridans Group <i>Streptococcus</i> and/or <i>Rothia spp.</i> alone but no organisms [†]	
identified by culture or non-culture based microbiologic testing method	identified by culture	
AND Patient meets at least one of the following:		
1. Is an allogeneic hematopoietic stem cell transplant recipient within the past year with one of the following documented during same hospitalization as positive blood specimen: a. Grade III or IV gastrointestinal graft versus host disease [GI GVHD] OR b. ≥1-liter diarrhea in a 24-hour period (or ≥20 mL/kg in a 24-hour period for patients <18 years of age) with onset on or within the 7 calendar days before the date the positive blood specimen was collected. OR 2. Is neutropenic, defined as at least two separate days with ANC[†] and/or WBC values <500 cells/mm³ collected within a 7-day time period which includes the collection date of the positive blood specimen, the 3 calendar days before and the 3 calendar days after.		

DIAGNOSI MICROBIOLOGICA



**CON
RIMOZIONE
DEL CATETERE**

**SENZA
RIMOZIONE
DEL CATETERE**

EMOCOLTURE QUANTITATIVE APPAIATE

- EMOCOLTURE CONVENZIONALI PRELEVATE CONTEMPORANEAMENTE DAL CATETERE E DAL SANGUE PERIFERICO
- POSITIVITÀ: POSITIVITÀ DELLE COLTURE DA ENTRAMBI I SITI, CON UNA CONCENTRAZIONE DI MICRORGANISMI DAL CATETERE 3-5 VOLTE SUPERIORE A QUELLA DEL SANGUE PERIFERICO
- 10 STUDI CONSIDERATI
- SENSIBILITÀ: 87%
- SPECIFICITÀ: 98%
- **TEST PIU' ACCURATO IN ASSOLUTO!**



DIFFERENTIAL TIME TO POSITIVITY

- EMOCOLTURE CONVENZIONALI PRELEVATE CONTEMPORANEAMENTE DAL CATETERE E DAL SANGUE PERIFERICO
- POSITIVITÀ: POSITIVITÀ DELLE COLTURE DA ENTRAMBI I SITI, CON QUELLE CENTRALI POSITIVE 2 E PIÙ ORE PRIMA RISPETTO A QUELLE DAL SANGUE PERIFERICO
- 10 STUDI CONSIDERATI
- SENSIBILITÀ 85%
- SPECIFICITÀ: 81%



Maki, Ann Inter Med 2005

Table 2 Summary of main diagnostic methods for catheter-related bloodstream infections.

	Criteria for positivity	Interpretation	Comments	Recommendation
<i>Diagnosis without catheter withdrawal</i>				
Paired quantitative blood cultures	Ratio $\geq 3:1$	Both sets are positive for the same microorganism and the set obtained through the catheter has $\geq 3:1$ fold-higher colony count than the peripheral culture	Sensitivity $\approx 79\%$ Specificity $\approx 99\%$ Labor intensive and expensive	A-II
Paired blood cultures for differential time to positivity (DTP)	≥ 120 min	Both sets are positive for the same microorganism and the set obtained through the catheter becomes positive ≥ 120 min earlier	Sensitivity: 72% to 96% Specificity: 90% to 95% Less specificity for long-term catheters The interpretation of DTP should take into account adherence to the technical procedure and the type of microorganism	A-II
Endoluminal brushing	> 100 CFU	Indicative of CRBSI	Sensitivity: 95% to 100% Specificity: 84% to 89% It may underestimate CRBSI in short-term catheters Risk of pathogen dissemination and thrombotic complications	C-III

DIFFICOLTÀ DIAGNOSTICHE

- MANCANZA DI PROTOCOLLI OMOGENEI PER L'ESECUZIONE DELLE EMOCOLTURE (NUMERO DI PRELIEVI DA EFFETTUARE, SITO DEL PRELIEVO, DISINFEZIONE DELLA CUTE, TIMING DI PRELIEVI SERIATI, VOLUME DI SANGUE DA PRELEVARE, CONTAMINAZIONI...)
- DIFFICOLTA' NELLA INTERPRETAZIONE DEI RISULTATI DELLE EMOCOLTURE

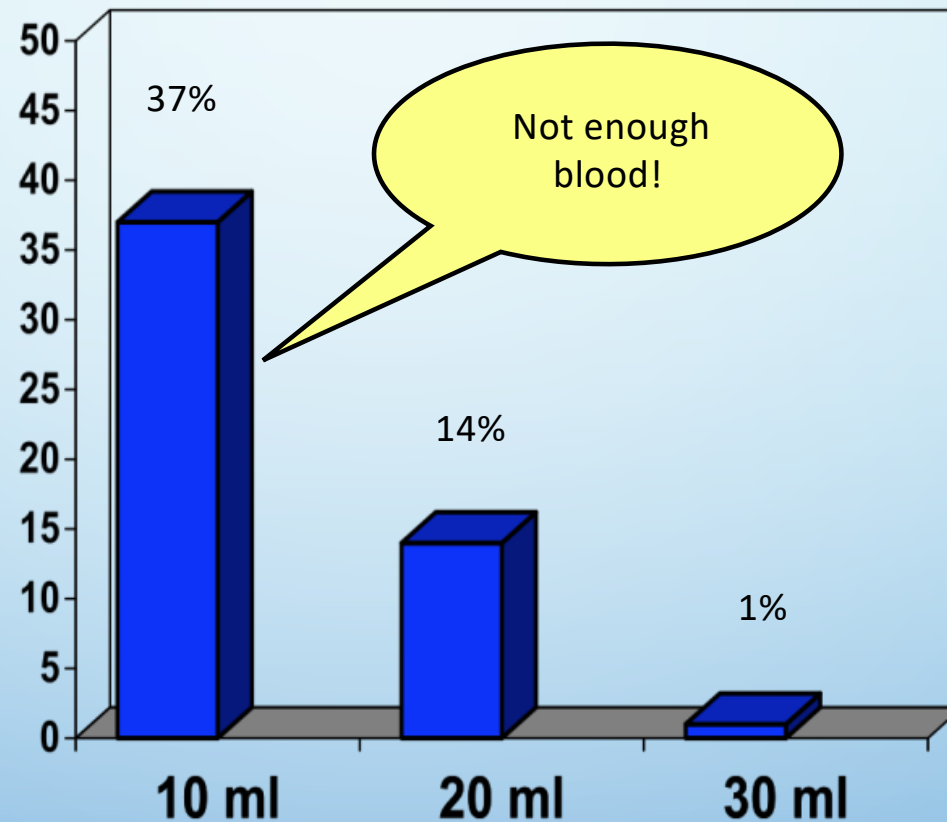
EMOCOLTURE

- QUANTE?
- QUANDO?
- QUANTO SANGUE?
- QUALE ANTISETTICO?
- “DISCARD VOLUME”?



% False Negative vs. Volume of Blood

% False Negative
(blood culture is negative but patient is really septicemic)

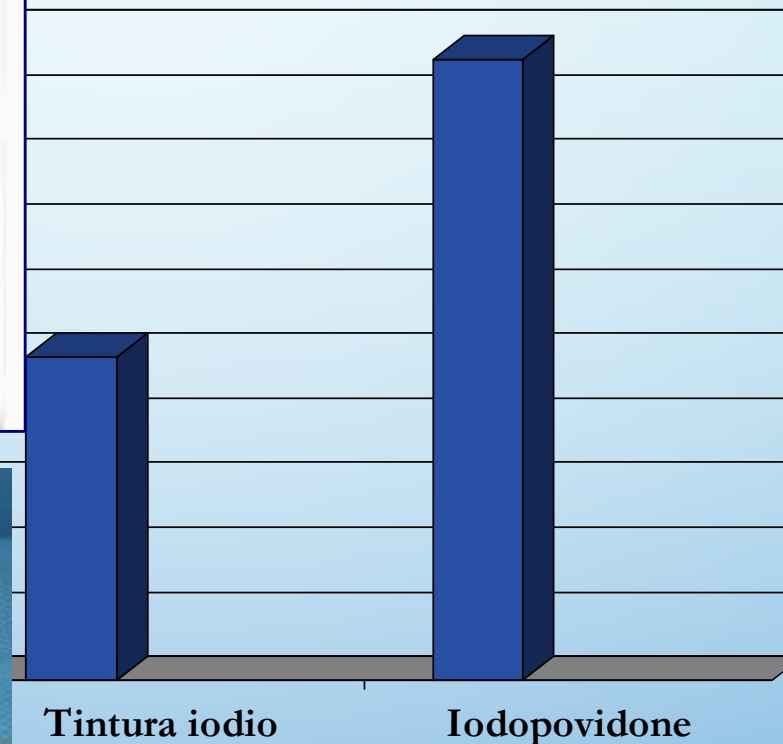
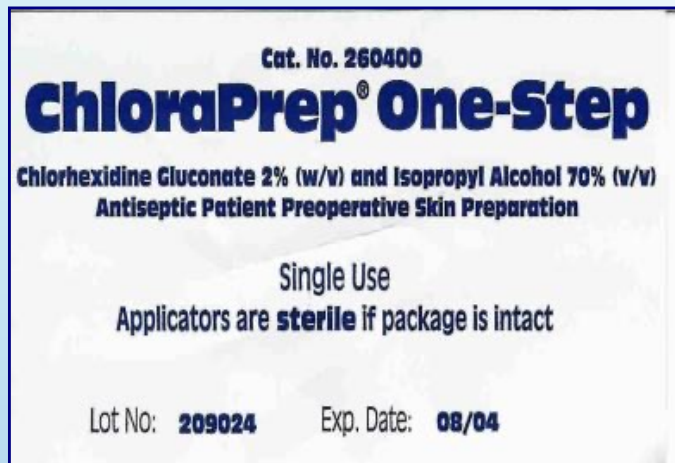


Courtesy of E.J Baron, PhD, Dir of Microbiology Lab, Stanford Hosp

VOLUME DI SANGUE

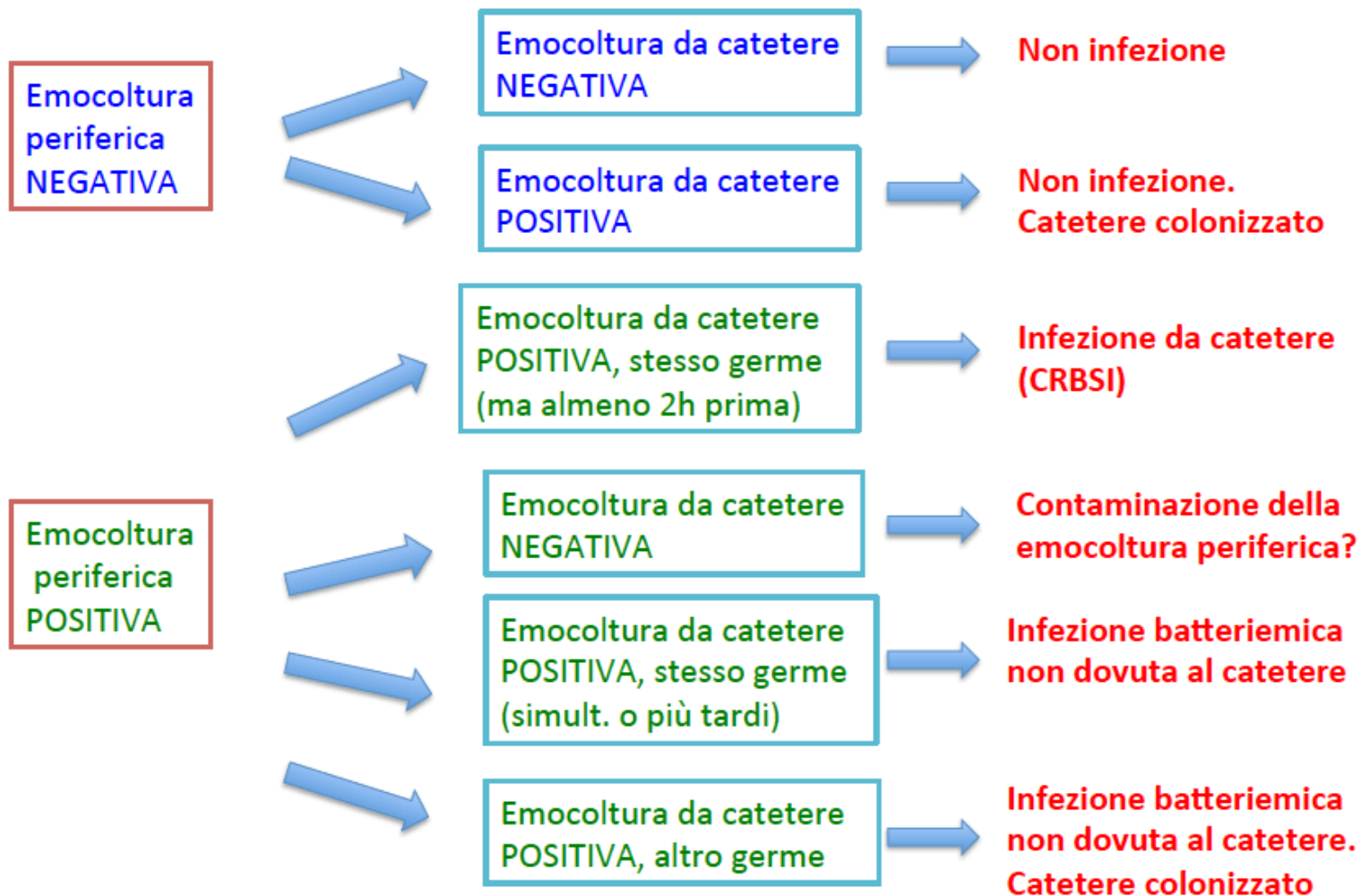
Peso (Kg)	ml per contenitore	ml per coppia
< 9	1	2
9-14	3	6
15-27	5	10
28-41	10	20
> 42	20	40

CONTAMINAZIONE DELLE EMOCOLTURE RISPETTO ALL'ANTISETTICO IMPIEGATO



Baylor, 2006

Interpretazione della DTP





medicina *intensiva*

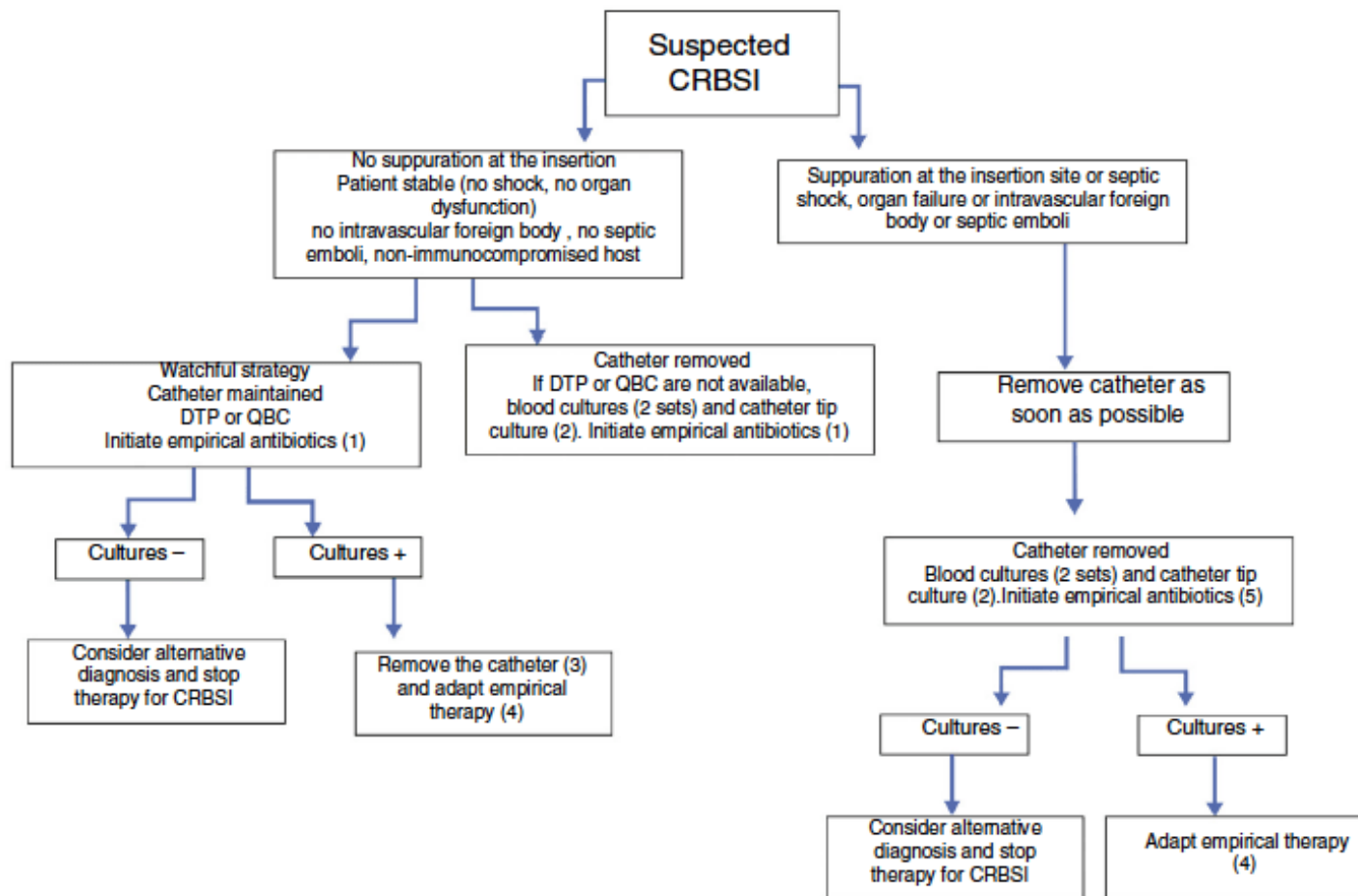
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Confirmed CRBSI

Coagulase-Negative *Staphylococcus*

- CoNS (1)
- Consider catheter removal (if not done) (2)
- Antimicrobial therapy for 5 days (3)
- Vancomycin is the first option (4)
- Echocardiography is not mandatory (5)
- Remove catheter if *S. lugdunensis* is isolated
- Catheter retained
 - Antimicrobial therapy for 10-14 days
 - Vancomycin in the first option (4)
 - ALT with vancomycin for 10-14 days
 - Echocardiography is not mandatory (5)

Staphylococcus aureus

- Removal of the catheter is mandatory
- Antimicrobial therapy for 14 days (6)
- Cloxacillin or cefazolin are the alternatives for MSSA
- Vancomycin or daptomycin are the alternatives for MRSA (7) (8)
- Echocardiography is mandatory

Enterococcus spp.

- Removal of the catheter is mandatory
- Antimicrobial therapy for 7-14 days
- Ampicillin is the drug of choice for susceptible strains (9)
- Vancomycin is the alternative for strains resistant to ampicillin (10)
- Echocardiography is mandatory

Gram-negative bacilli

- Remove the catheter (if not done) (2)
- Antimicrobial therapy for at least 7 days (3)
- Antimicrobial therapy must be chosen based on the susceptibility results
- Echocardiography is not mandatory (5)
- Catheter retained (11)
 - Antimicrobial therapy for 10-14 days
 - Antimicrobial therapy must be chosen based on the susceptibility results
 - ALT for 10-14 days
 - Echocardiography is not mandatory (5)

Candida spp.

- Removal of the catheter is mandatory
- Antifungal therapy for 14 days after the first negative blood culture (12)
- Targeted antifungal therapy must be chosen based on the susceptibility results (13)
- Echocardiography is mandatory

Clinical Practice Guidelines for the Diagnosis and Management of Intravascular Catheter-Related Infection: 2009 Update by the Infectious Diseases Society of America

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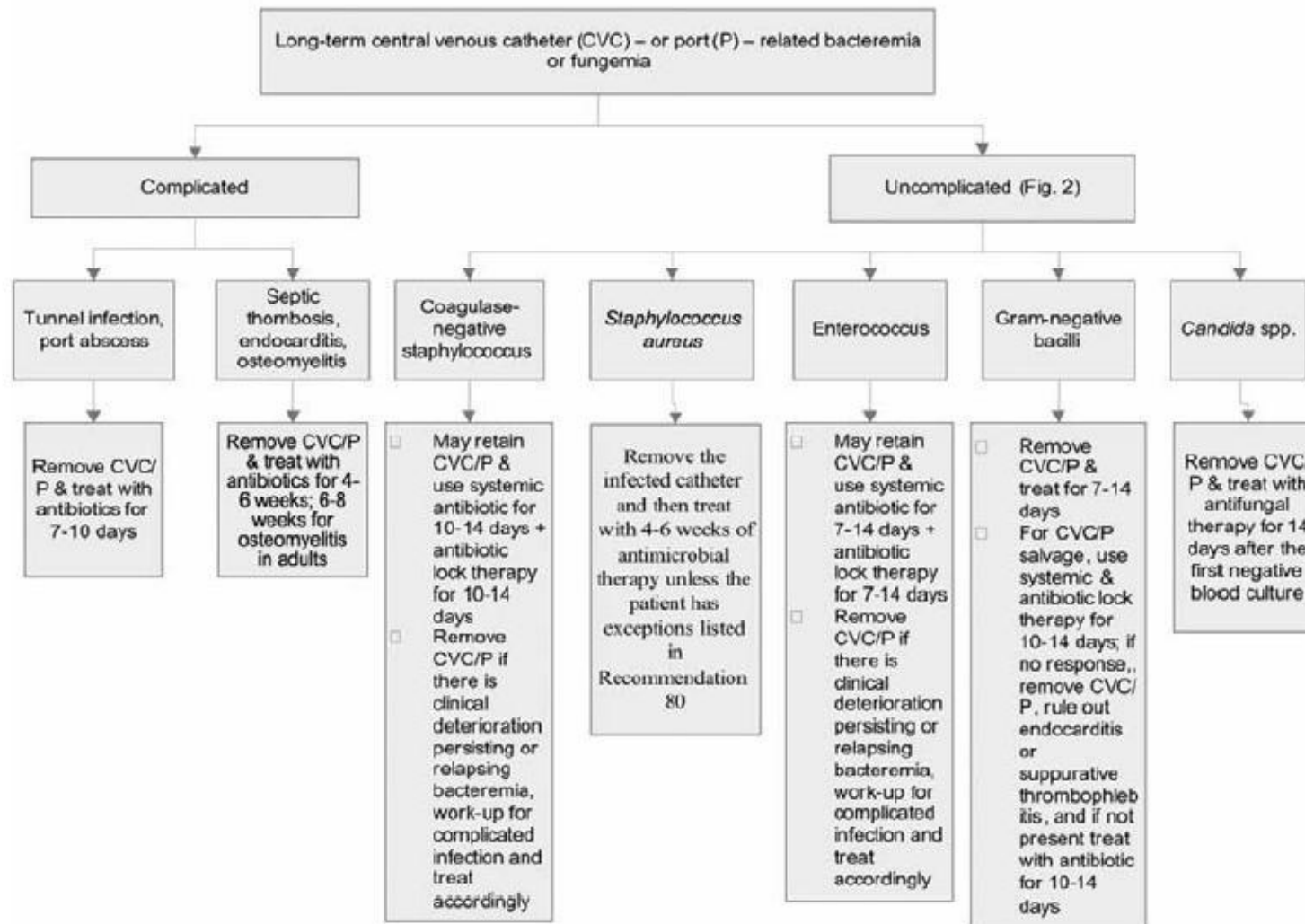


Figure 3. Approach to the treatment of a patient with a long-term central venous catheter (CVC) or a port (P)-related bloodstream infection.

Antibiotic-lock therapy: a clinical viewpoint

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

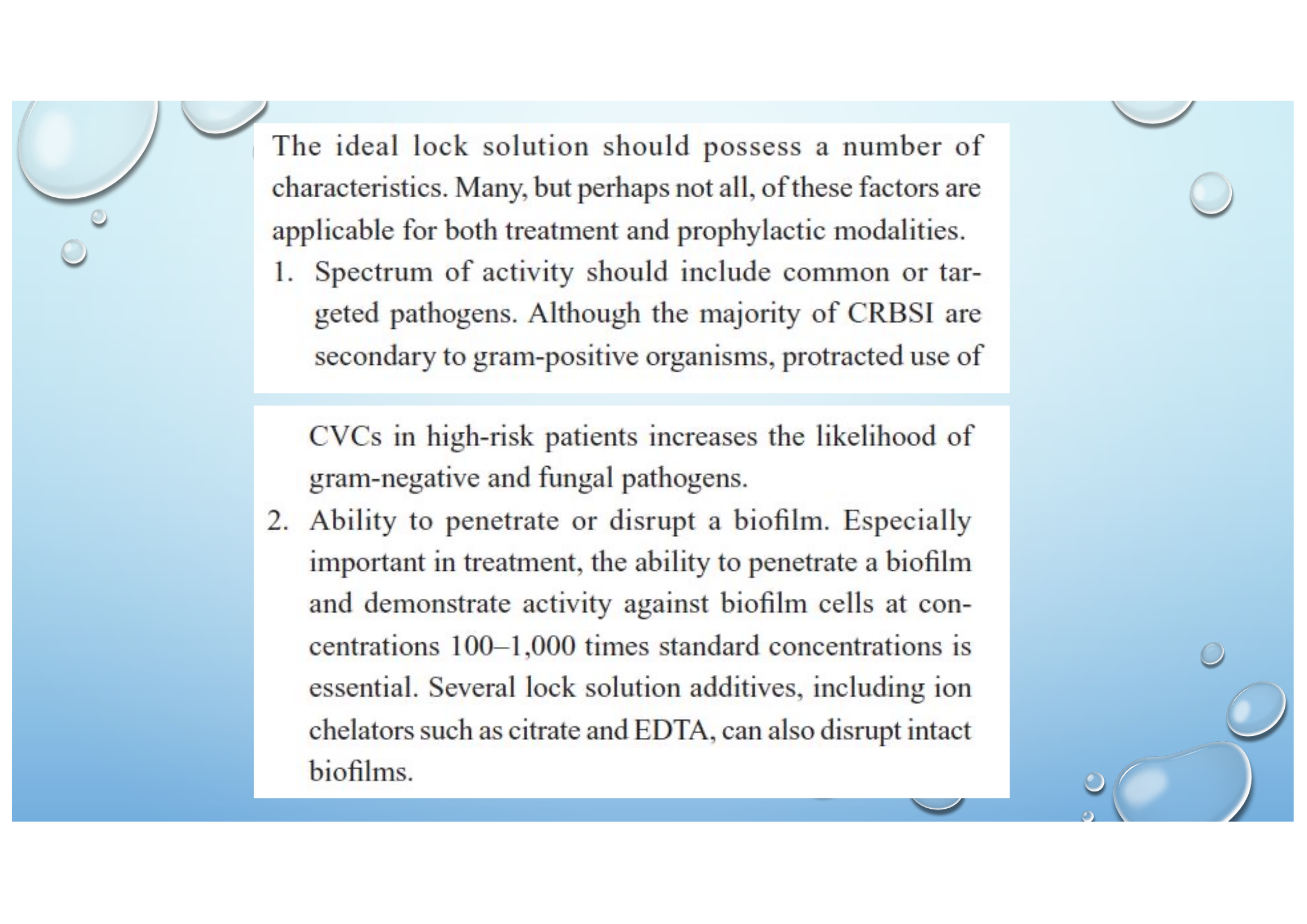
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Antibiotic lock therapy (ALT) – instillation of high concentrations of anti-microbial agent with or without anti-coagulant into the lumen of central venous catheters – is considered a valid conservative treatment for catheter-related bloodstream infection (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

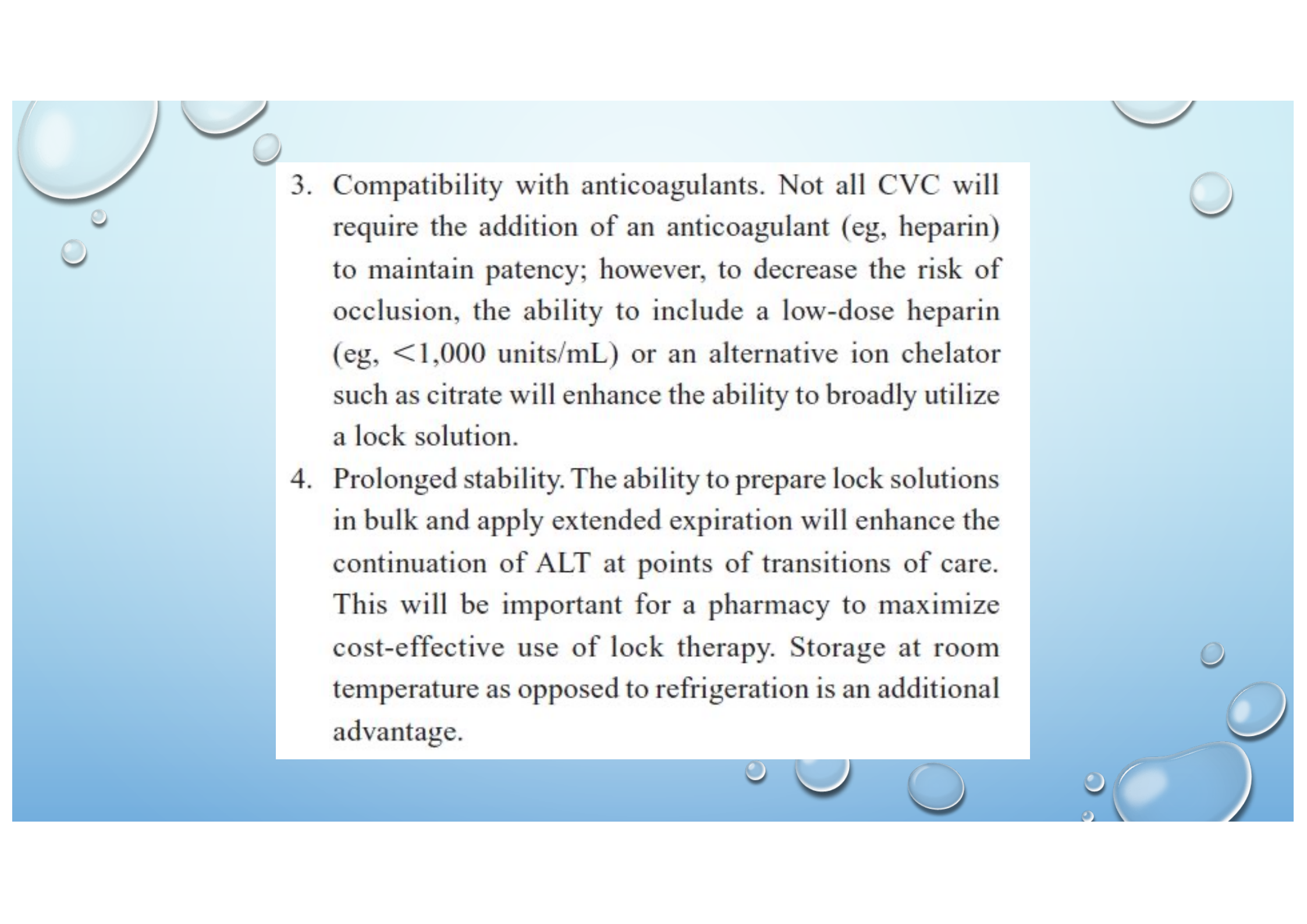


The ideal lock solution should possess a number of characteristics. Many, but perhaps not all, of these factors are applicable for both treatment and prophylactic modalities.

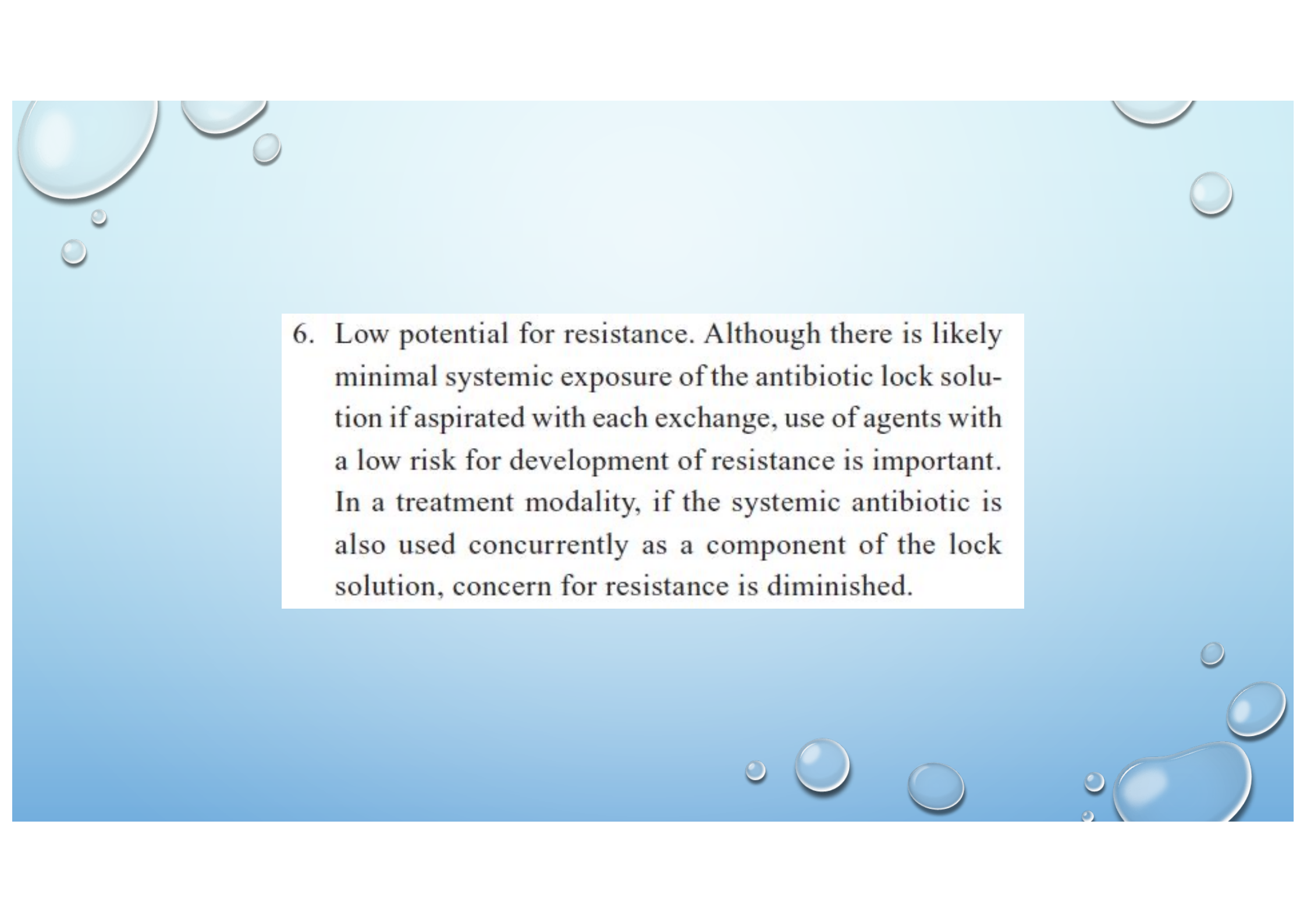
1. Spectrum of activity should include common or targeted pathogens. Although the majority of CRBSI are secondary to gram-positive organisms, protracted use of

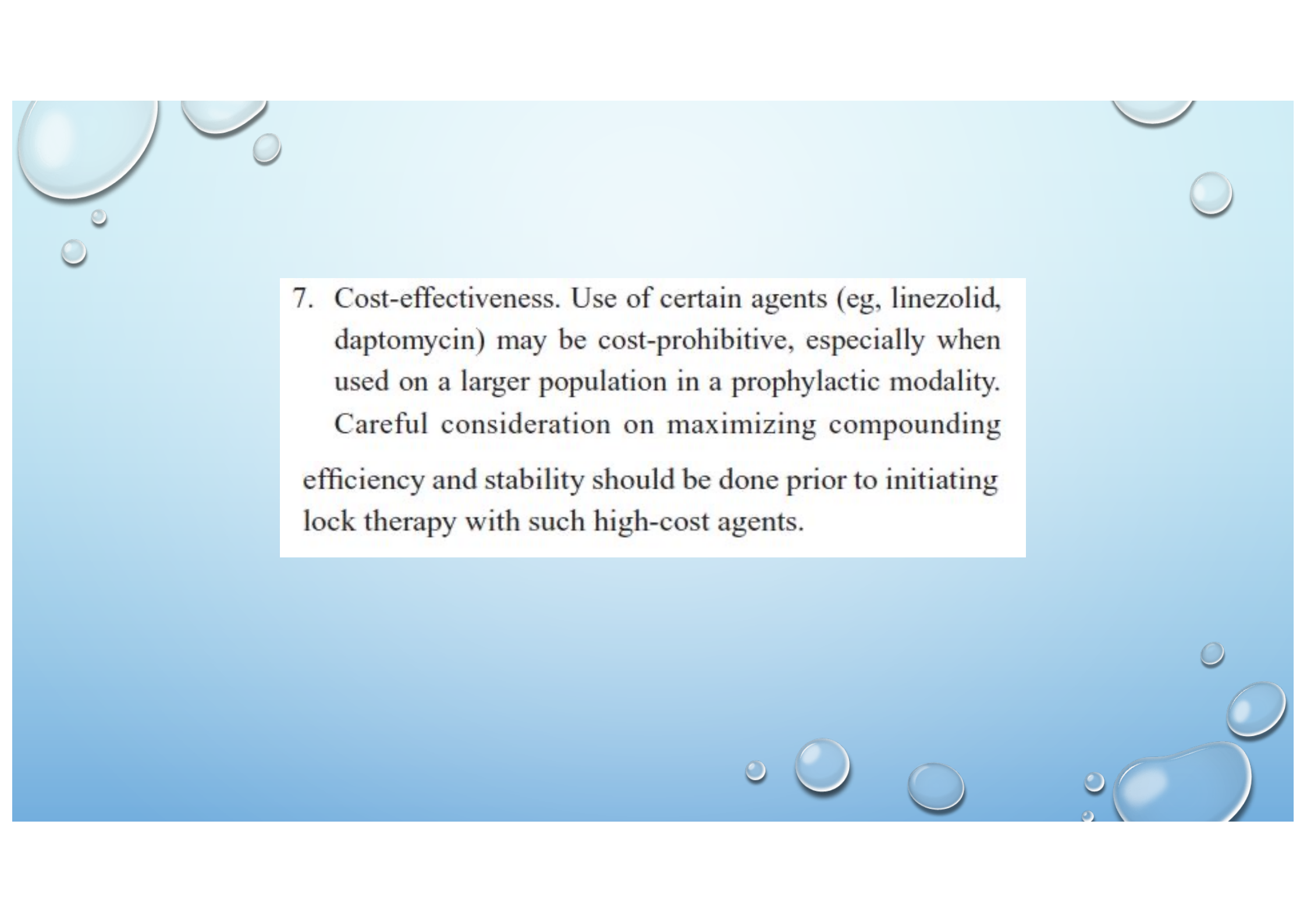
CVCs in high-risk patients increases the likelihood of gram-negative and fungal pathogens.

2. Ability to penetrate or disrupt a biofilm. Especially important in treatment, the ability to penetrate a biofilm and demonstrate activity against biofilm cells at concentrations 100–1,000 times standard concentrations is essential. Several lock solution additives, including ion chelators such as citrate and EDTA, can also disrupt intact biofilms.

- 
3. Compatibility with anticoagulants. Not all CVC will require the addition of an anticoagulant (eg, heparin) to maintain patency; however, to decrease the risk of occlusion, the ability to include a low-dose heparin (eg, <1,000 units/mL) or an alternative ion chelator such as citrate will enhance the ability to broadly utilize a lock solution.
 4. Prolonged stability. The ability to prepare lock solutions in bulk and apply extended expiration will enhance the continuation of ALT at points of transitions of care. This will be important for a pharmacy to maximize cost-effective use of lock therapy. Storage at room temperature as opposed to refrigeration is an additional advantage.

5. Low risk of toxicity and adverse events. The small volumes used in the intraluminal space do not lend themselves to high risk of toxicity. However, higher concentrations of specific agents (eg, aminoglycosides and citrate) have been associated with significant toxicity and should be avoided when using ALT.^{18,19} There is additional concern if these solutions are flushed as opposed to aspirated, which could expose the patient to higher concentrations of anticoagulants (eg, heparin). Ethanol at higher concentrations may be associated with minor adverse events, especially in low-weight neonates.¹⁴ Catheter occlusion is another possible adverse event with ALT, especially in the absence of a low-dose anticoagulant in solution.

- 
6. Low potential for resistance. Although there is likely minimal systemic exposure of the antibiotic lock solution if aspirated with each exchange, use of agents with a low risk for development of resistance is important. In a treatment modality, if the systemic antibiotic is also used concurrently as a component of the lock solution, concern for resistance is diminished.

The background of the slide is a light blue gradient. It is decorated with several realistic water droplets of various sizes, some with highlights and shadows, giving them a 3D appearance. The droplets are scattered across the top and bottom edges of the slide.

7. Cost-effectiveness. Use of certain agents (eg, linezolid, daptomycin) may be cost-prohibitive, especially when used on a larger population in a prophylactic modality. Careful consideration on maximizing compounding efficiency and stability should be done prior to initiating lock therapy with such high-cost agents.

Table 1 Summary of biofilm penetration for select antibiotics

Antibiotic class/agent	Microorganism	Extent of penetration	Rate of penetration	Reference
Fluoroquinolones				
Ciprofloxacin	<i>Bacillus cereus</i> , <i>Pseudomonas fluorescens</i>	100%	NR	10
	<i>Pseudomonas aeruginosa</i>	100%	Rapid	74
	<i>P. aeruginosa</i>	25%–50%	Rapid	75
	<i>Klebsiella pneumoniae</i>	80%–100%	Rapid	11
	<i>Staphylococcus aureus</i> , <i>Staphylococcus epidermidis</i>	86%–100%	NR	76
Levofloxacin	<i>P. aeruginosa</i>	100%	Rapid	75
Rifamycins				
Rifampin	<i>S. epidermidis</i>	79% to >90%	Rapid	77,78
Oxazolidinones				
Linezolid	<i>S. epidermidis</i>	~100% ^a	Rapid	79
Lipopeptides				
Daptomycin	<i>S. epidermidis</i>	≥100% ^b	Rapid	80
Tetracyclines				
Tetracycline	<i>B. cereus</i> , <i>P. fluorescens</i>	88%–93%	NR	10
Macrolides				
Erythromycin	<i>B. cereus</i> , <i>P. fluorescens</i>	72%–86%	NR	10
	<i>S. epidermidis</i>	45%–93%	Variable/slow	81

Beta-lactams

Ampicillin	<i>K. pneumoniae</i> (beta-lactamase positive)	0%	NA	11
	<i>K. pneumoniae</i> (beta-lactamase negative)	80%–100%	Rapid	11
Oxacillin	<i>S. aureus</i> , <i>S. epidermidis</i>	<70%	NR	76
Piperacillin	<i>P. aeruginosa</i>	50%–100%	Rapid	75
	<i>P. aeruginosa</i>	0%–15%	NR	82
Cefotaxime	<i>S. aureus</i> , <i>S. epidermidis</i>	68%–70%	NR	76
Imipenem	<i>P. aeruginosa</i>	50%–100%	Rapid	75

Glycopeptides

Vancomycin	<i>S. aureus</i> , <i>S. epidermidis</i>	<70%	NR	76
	<i>S. epidermidis</i>	Adequate ^c	Slow	77,83
	<i>S. aureus</i>	Adequate ^{b,d}	Slow	9

Aminoglycosides

Streptomycin	<i>B. cereus</i> , <i>P. fluorescens</i>	0%–60%	NR	10
Tobramycin	<i>P. aeruginosa</i>	40%	Slow	74
Gentamicin	<i>P. aeruginosa</i>	<25%	Slow	75
Amikacin	<i>P. aeruginosa</i>	<25%	Slow	75
	<i>S. aureus</i> , <i>S. epidermidis</i>	79%–98%	NR	76

Notes: ^aComparable penetration compared to isolates of planktonic cells; ^bmeasured as intensity of fluorescence using confocal microscopy or other methods; ^cvancomycin concentrations reportedly exceeded the minimal inhibitory concentrations and minimal bactericidal concentrations for tested isolates; ^drepresents vancomycin concentrations from 15–45 µg/mL.

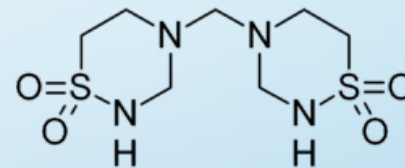
Abbreviations: NA, not applicable; NR, not reported.

SOSTANZE AD ATTIVITA' ANTIMICROBICA (NON ANTIBIOTICI)

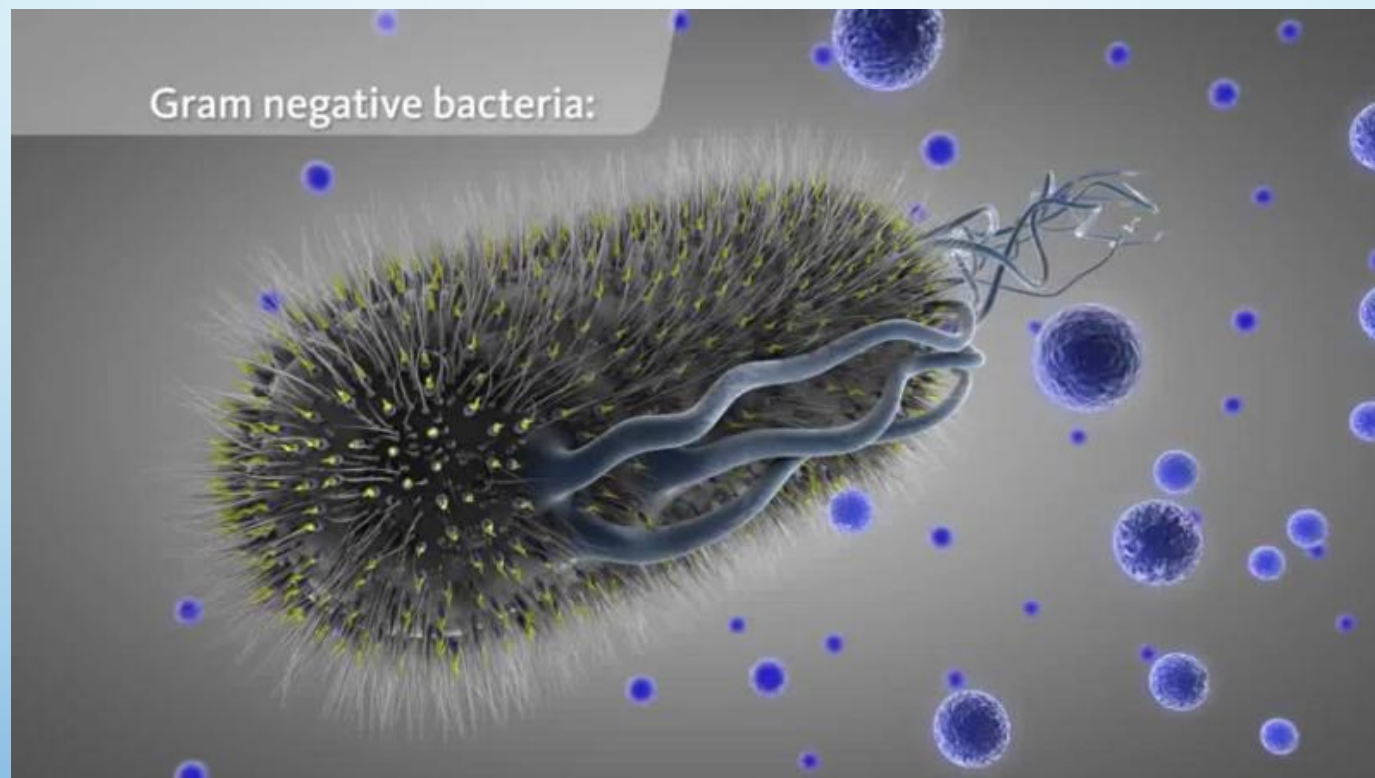
- ETANOLO
- TAUROLIDINA
- CITRATO
- EDTA

TAUROLIDINA

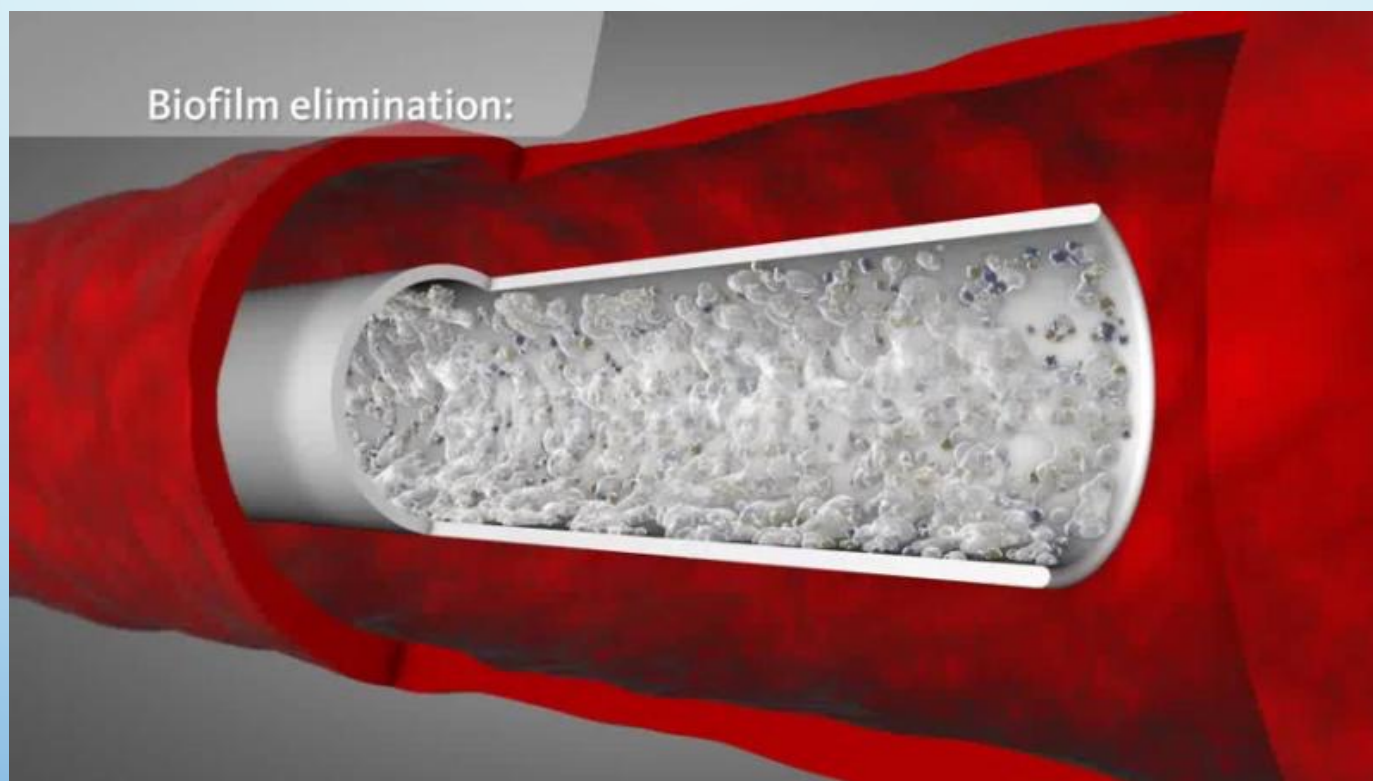
- DERIVATO DELL'AMINOACIDO TAURINA, UN AGENTE ANTIMICROBICO CON AMPIO SPETTRO DI AZIONE ANTIBATTERICO E ANTIFUNGINO
- I DERIVATI METILICI DELLA TAUROLIDINA INTERAGISCONO CON LA PARETE BATTERICA (IN PARTICOLARE FLAGELLI E FIMBRIE), PROVOCANDO UN DANNO IRREVERSIBILE DELLA PARETE BATTERICA, CHE CONSISTE NELLA IMPOSSIBILITÀ DI ADESIONE **(IMPOSSIBILITÀ QUINDI A FORMARE IL BIOFILM!)**



AZIONE DELLA TAUROLIDINA



AZIONE DELLA TAUROLIDINA



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

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Valentina Da Ros⁴ and Fabio Fabiani¹

Abstract

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

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CONCLUSIONI

- LA DECISIONE DI RIMUOVERE O MENO UN CVC IN CORSO DI EPISODIO FEBBRILE DEVE ESSERE ASSOLUTAMENTE INDIVIDUALIZZATA
- VA TENUTO IN CONSIDERAZIONE INNANZITUTTO LO STATO CLINICO DEL PAZIENTE (SIRS, SEPSI, SHOCK SETTICO; PRESENZA O ASSENZA DI COMPLICANZE METASTATICHE)
- IN SECONDO LUOGO VA CONSIDERATA LA TIPOLOGIA DI DISPOSITIVO VASCOLARE
- INFINE VA CONSIDERATA LA POSSIBILITA' DI RIPOSIZIONAMENTO PIU' O MENO AGEVOLE DEL VAD, INCLUSI I RISCHI CONNESSI PER IL PAZIENTE

GRAZIE PER L'ATTENZIONE!
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