

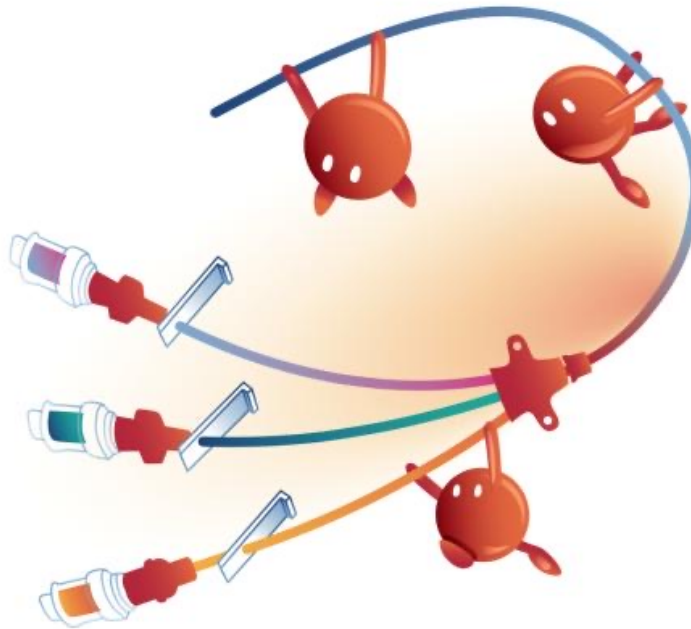
Potenzialità dell'utilizzo della tauroolidina nel neonato

Fiammetta Piersigilli

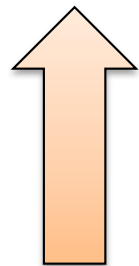


Il catetere vascolare

Colonizzazione



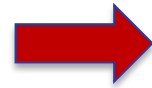
Infezione



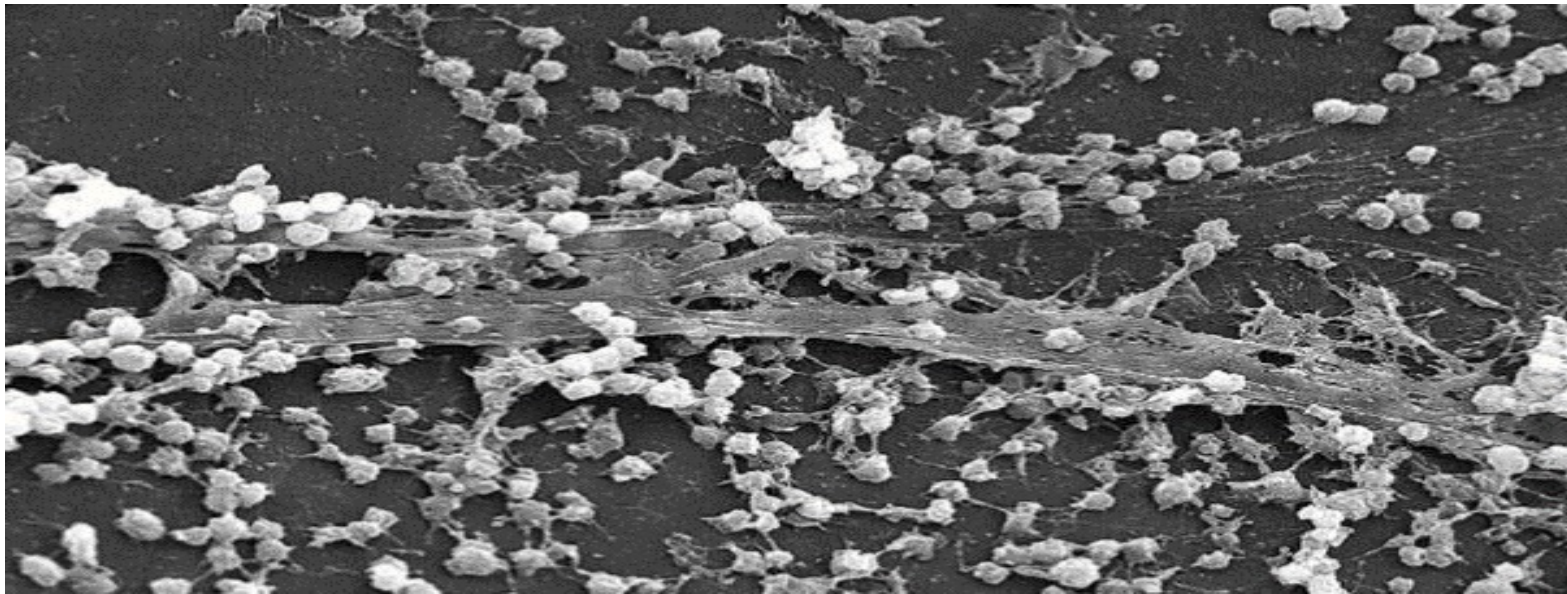
costi di ospedalizzazione
morbilità
durata di ricovero

Colonizzazione del cvc

Il nostro nemico



Il Biofilm



Germi

Matrice extracellulare



Acqua, DNA, fibrina, piastrine

Il Biofilm

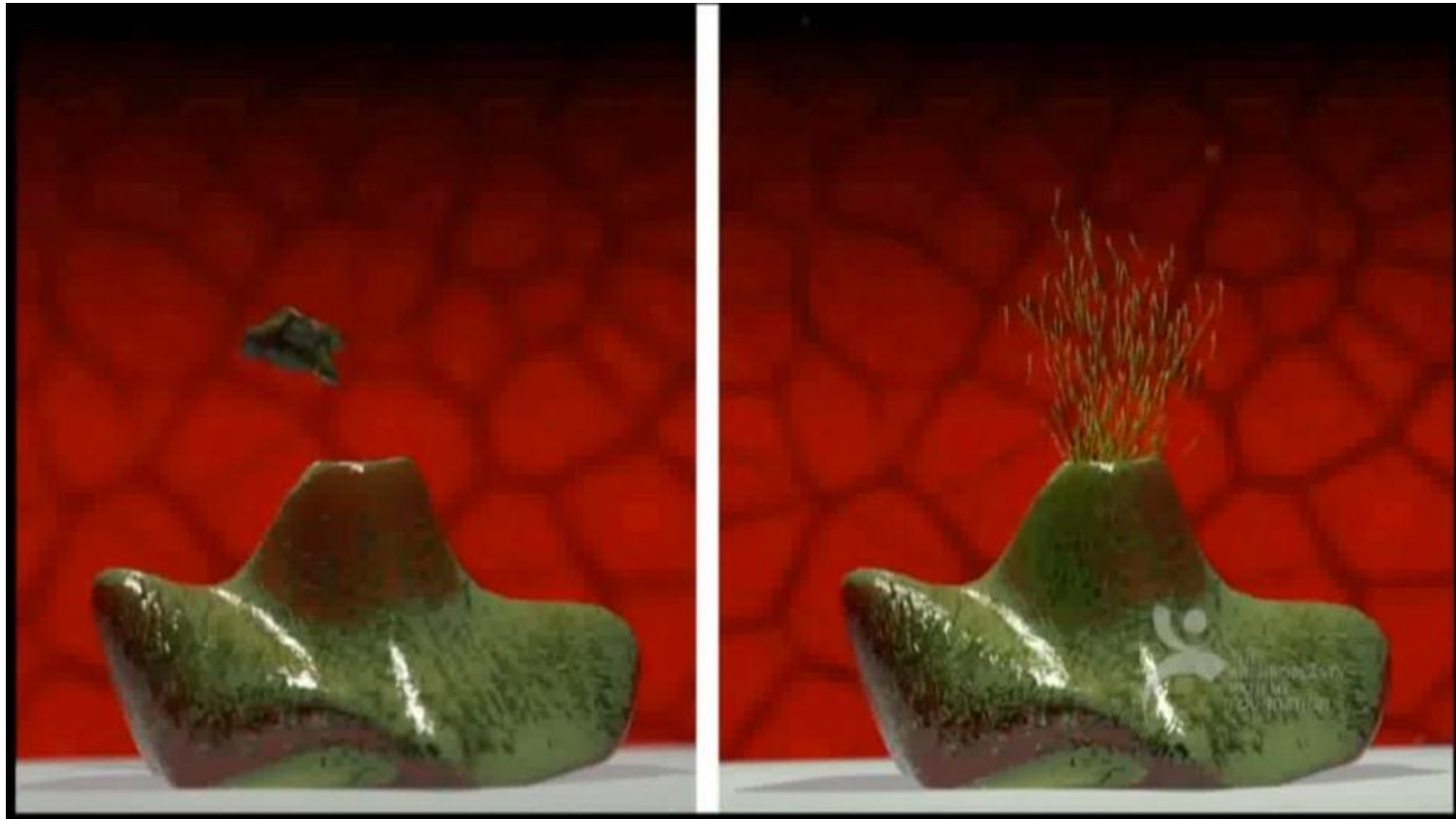


Protegge i batteri da cellule immunitarie e antibiotici

Ridotto metabolism batterico

Ridotta sensibilità agli antibiotici

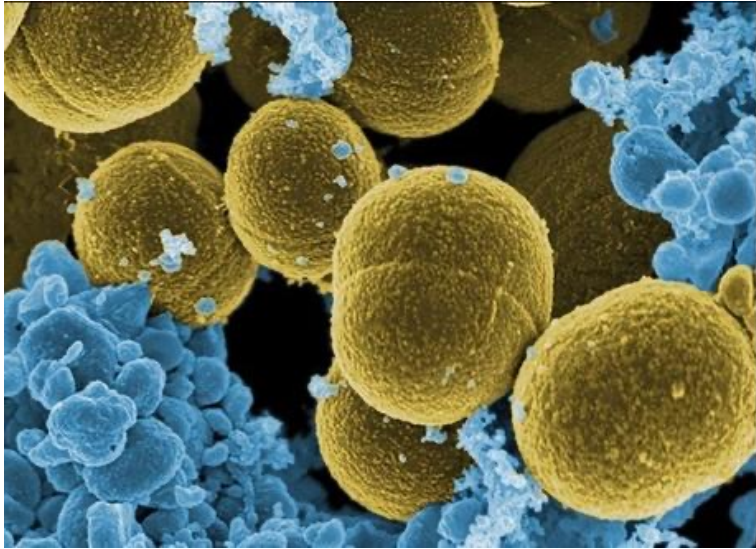
Il Biofilm



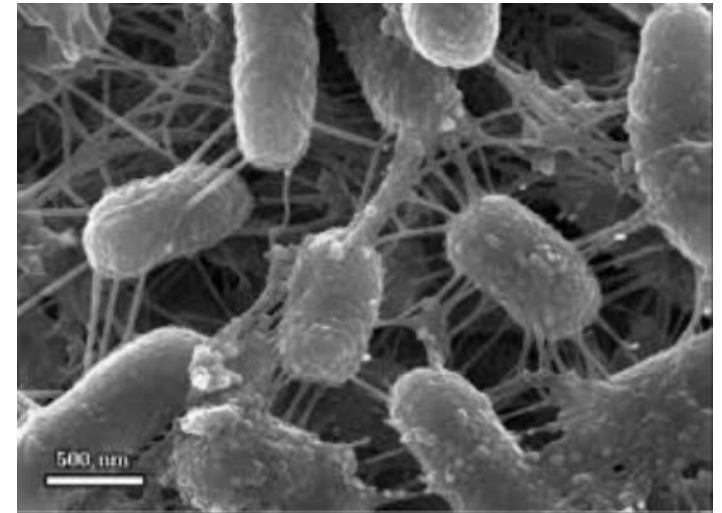
Necessità di dosi maggiori di antibiotici e per più lunga durata

Formazione di nuove colonie batteriche con elevata resistenza agli antibiotici

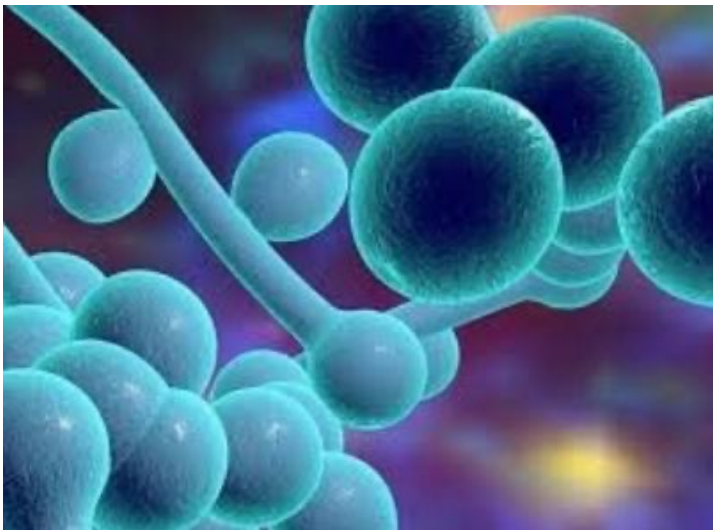
Germi associati al Biofilm



Staphylococcus aureus

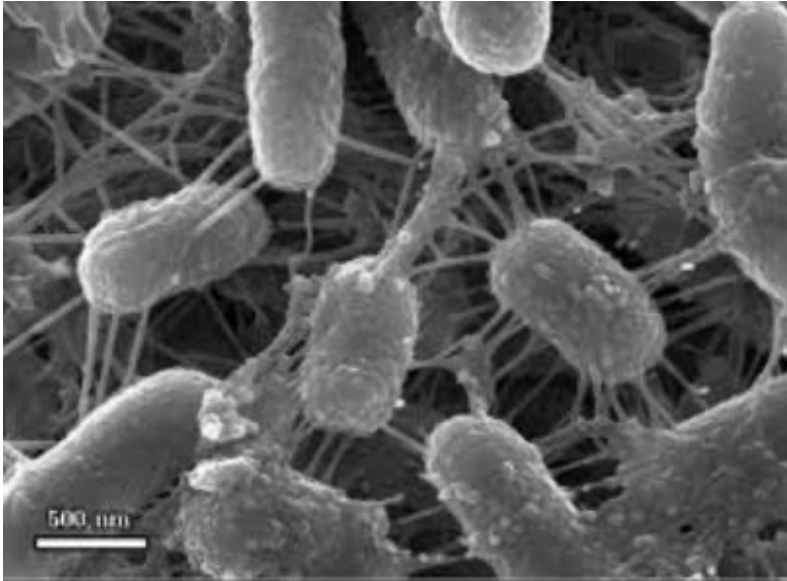


Gram negativi



Candida species

Rimozione del catetere?

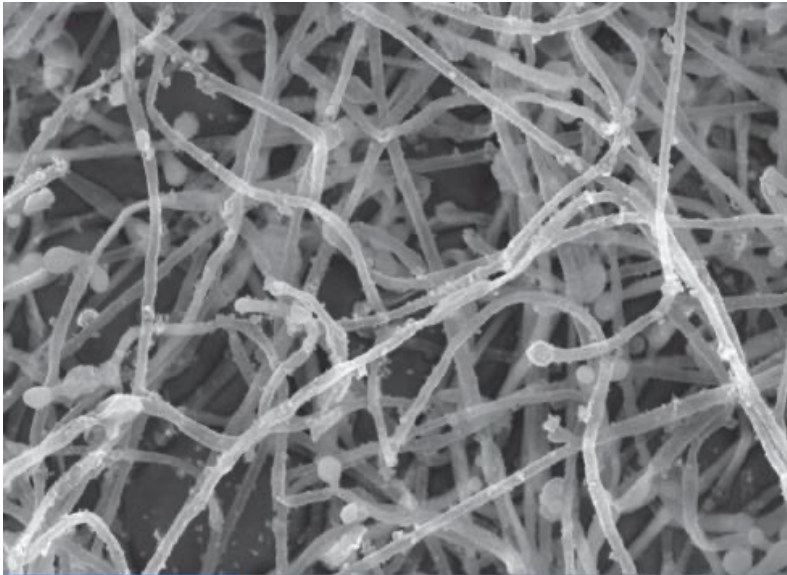


Rimozione suggerita

Staph aureus
Pseudomonas
Gram negativi



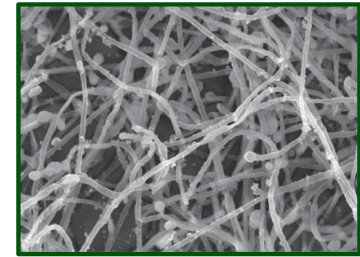
Se non si ha miglioramento rapido
dopo l'inizio della terapia antibiotica



Rimozione raccomandata

Candida sepsis

Rimozione del catetere?



“Failure to promptly remove or replace central venous catheters for infants with candidemia places the infant at increased risk of prolonged infection, mortality, and long-term irreversible NDI”



TABLE 3. Outcomes of Candidemia in Infants With ER-CVCs and LR-CVCs

Outcome	ER-CVC <i>n</i> = 50	LR-CVC <i>n</i> = 54	<i>P</i> Value
	Median (range)	Median (range)	
Candidemia survivor length of stay (d)	109 (34–322)	112 (38–454)	.34
Duration of candidemia (d)	3 (1–14)	6 (1–24)	.0002
Duration of amphotericin B therapy (d)	18 (5–60)	21 (5–51)	.14
	No. (%)	No. (%)	
Candidemia case fatality	1 (2)	10 (19)	.008

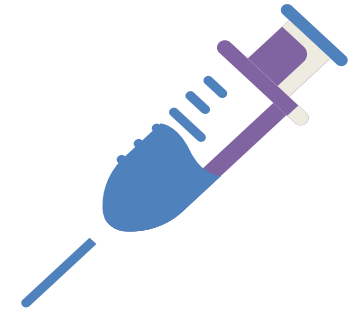
Should Central Venous Catheters Be Removed as Soon as Candidemia Is Detected in Neonates?

M. Gary Karłowicz, Laura Nickles Hashimoto, Robert E. Kelly, Jr. and E. Stephen Buescher. 2000



Ma è possibile salvare il CVC
nel caso di un bambino
altamente instabile in cui
non possiamo rimuovere il
catetere?

Antibiotic lock therapy



La **antibiotic lock therapy** consiste
nell'instillazione all'interno del catetere
di dosi di antibiotico fino a 1000 volte la MIC,
eventualmente in associazione con etanolo / eparina,
per una durata che può andare dalle 12 alle 48 ore,
per vari giorni (fino a 14gg),
SEMPRE
in combinazione con la terapia antibiotica sistemica

Lock del catetere



Consiste nell'instillazione
all'interno del catetere
di una soluzione

(priming volume+20%/ priming volume X2)

Use of Meropenem and Other Antimicrobial Lock Therapy in the Treatment of Catheter-Related Blood Stream Infections in Neonates: A Retrospective Study

Fiammetta Piersigilli ^{1,*}, Cinzia Auriti ², Andrea Dotta ², Bianca Maria Goffredo ³, Sara Cairoli ³, Immacolata Savarese ², Francesca Campi ², Tiziana Corsetti ⁴ and Iliana Bersani ²



Vancomycin

5 mg/ml
10 mg/ml

Merrem

2 mg/ml

Ceftazidime

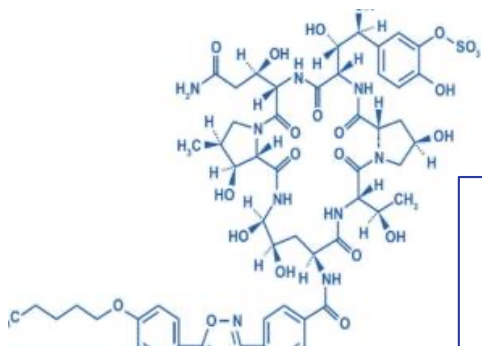
20 mg/ml

Gentamycin

4 mg/ml

Cefazoline

10 mg/ml



Micafungin

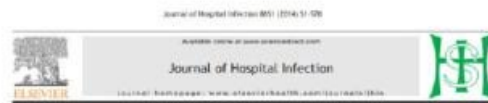
5mg/L

Antifungal Lock Therapy With Combined 70% Ethanol and Micafungin in a Critically Ill Infant

Piersigilli, Fiammetta PhD^{*}; Auriti, Cinzia MD^{*}; Bersani, Iliana MD^{*}; Goffredo, Bianca MD[†]; Bianco, Giuseppe MD[‡]; Savarese, Imma MD^{*}; Dotta, Andrea PhD^{*}

Pediatric Infectious Disease Journal: April 2014 - Volume 33 - Issue 4 - p 419–420

E se usassimo la profilassi?..



epic3: National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England
H.P. Loveday^{a*}, J.A. Wilson^a, R.J. Pratt^a, M. Golsorkhi^a, A. Tingle^a, A. Bak^a, J. Browne^a, J. Prieto^a, M. Wilcox^a

Antimicrobial lock solutions should not be used routinely to prevent catheter-related bloodstream infections.

CDC Guidelines

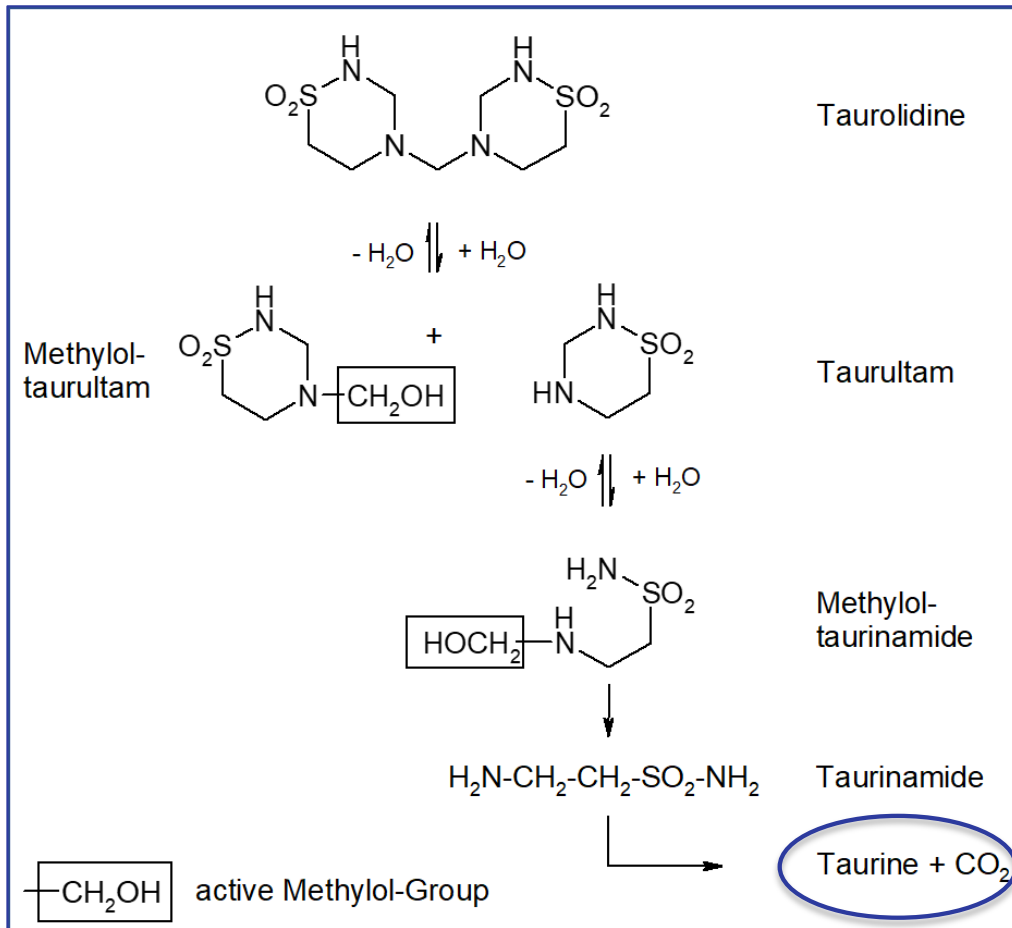
Do not administer systemic antimicrobial prophylaxis routinely before insertion or during the use of an intravascular catheter to prevent catheter colonization or CRBSI

Antibiotic lock prophylaxis

Infusion Therapy Standards of Practice

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 CVAD-associated BSI, despite implementation of other methods of infection prevention.^{27,62-79} (II)

Taurolidina



Precursore della taurina

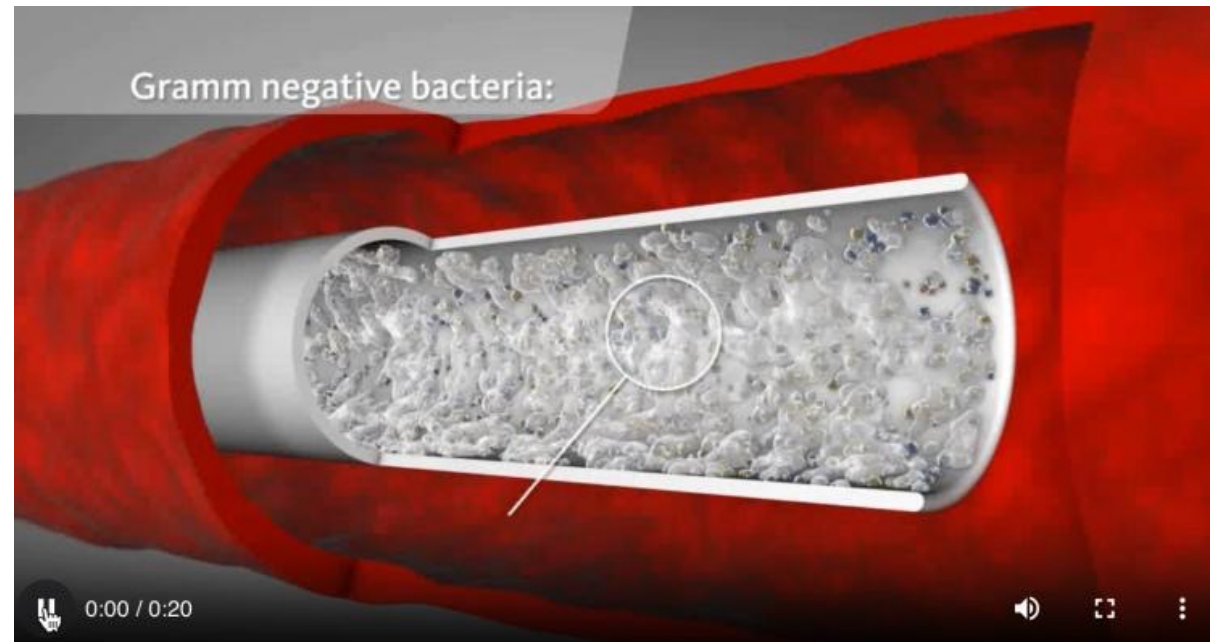
Ampio spettro battericida/fungicida

Azione su batteri resistenti

Non sviluppa resistenze

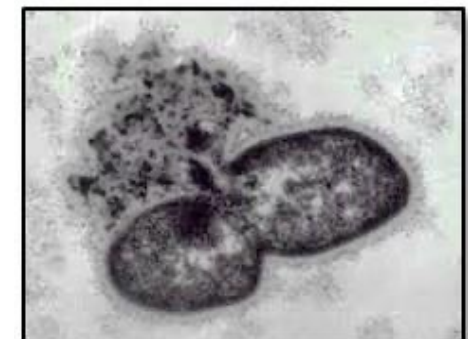
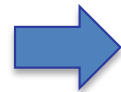
Non sviluppa allergie

Taurolidina



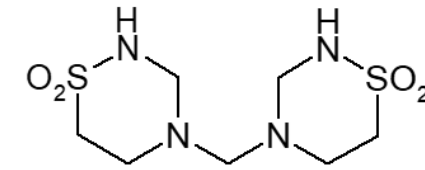
Ampio spettro battericida/fungicida

Reagisce con le fimbrie



Distrugge parete cellulare

Taurolidina



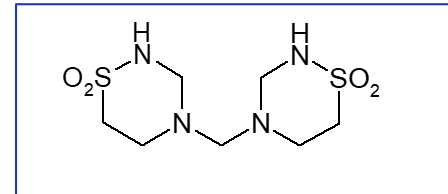
Batteri aerobi /anaerobi / funghi

Antimicrobial spectrum

In vitro activity of taurolidine (MIC₅₀ mg/ml)

<u>Staph aureus</u>	0,25 – 0,5	Acinetobacter spec.	0,5
<u>Staph. epidermidis</u>	0,25 – 0,5	Moraxella catarrhalis	0,5
Enterococcus faecalis	0,25	<u>Pseud. aeruginosa</u>	0,5 – 1,0
Strept. haemolyticus	0,125 – 0,25	Bacteroides fragilis	0,25
Strept. pneumoniae	0,125 – 0,25	Bact. thetaiotaomicron	0,25
Strept. viridans	0,25	Burkholderia cepacia	0,5
Klebs. pneumoniae	0,25 – 0,5	Clostridium difficile	0,125
Klebs. oxytoca	0,125 – 0,5	Clostridium perfringens	0,125
Enterobacter cloacae	0,5	Corynebacterium spec.	0,25
Enterobacter aerogenes	0,5	Peptostreptococcus spec.	0,125 – 0,25
Citrobacter freundii	0,5	Peptococcus spec	0,125
Proteus mirabilis	0,25 – 0,5	Fusobacterium	0,125 – 0,25
Proteus vulgaris	0,25 – 0,5	Salmonella thypimurium	0,8
Morganella morganii	0,25 – 0,5	Shigella flexneri/sonnei	0,8
Serratia marcescens	0,125 – 0,5	<u>Candida albicans</u>	0,5 – 1,0
Listeria monocytogenes	0,5	Rhodotorula spec.	0,125 – 0,5

Lock terapeutico



Original research article

JVA | The Journal of
Vascular Access

The Journal of Vascular Access
1-5
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DOI: 10.1177/11297298211026453
journals.sagepub.com/home/jva
SAGE

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

Fabrizio Brescia¹ , Mauro Pittiruti² , Giancarlo Scoppettuolo³, Chiara Zanier¹, Elisa Nadalini¹, Paola Bottos¹, Chiara Moreal¹, Valentina Da Ros⁴ and Fabio Fabiani¹

Comparative Study > Zentralbl Chir. 2009 Aug;134(4):350-6. doi: 10.1055/s-0028-1098929.

Epub 2009 Aug 17.

[Spectrum of indications and perioperative management in i. v. port-a-cath explantation-- alternative administration of taurolin in case of i. v. port-a-cath infection]



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

Antimicrobial
Agents
www.ischemo.org

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

M. Koldehoff^{a,*}, J.L. Zakrzewski^b

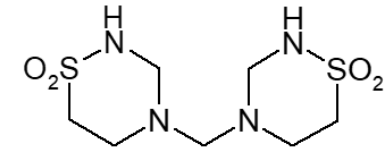
^a Department of Bone Marrow Transplantation, University Hospital Essen, Hufelandtstrasse 33, 45122 Essen, Germany

^b Memorial Sloan Kettering Cancer Center, New York City, USA

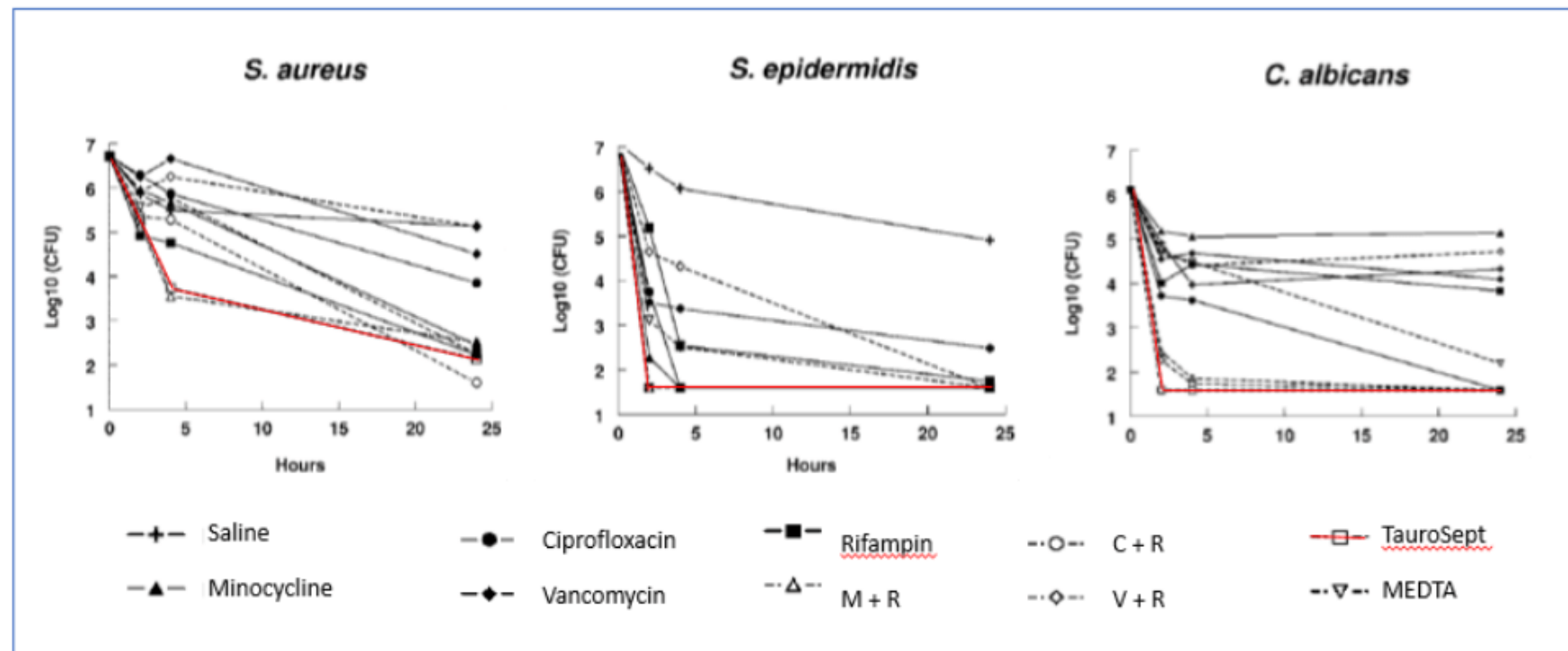
Received 29 March 2004; accepted 9 June 2004

Lock del catetere di almeno 2 ore

Lock terapeutico

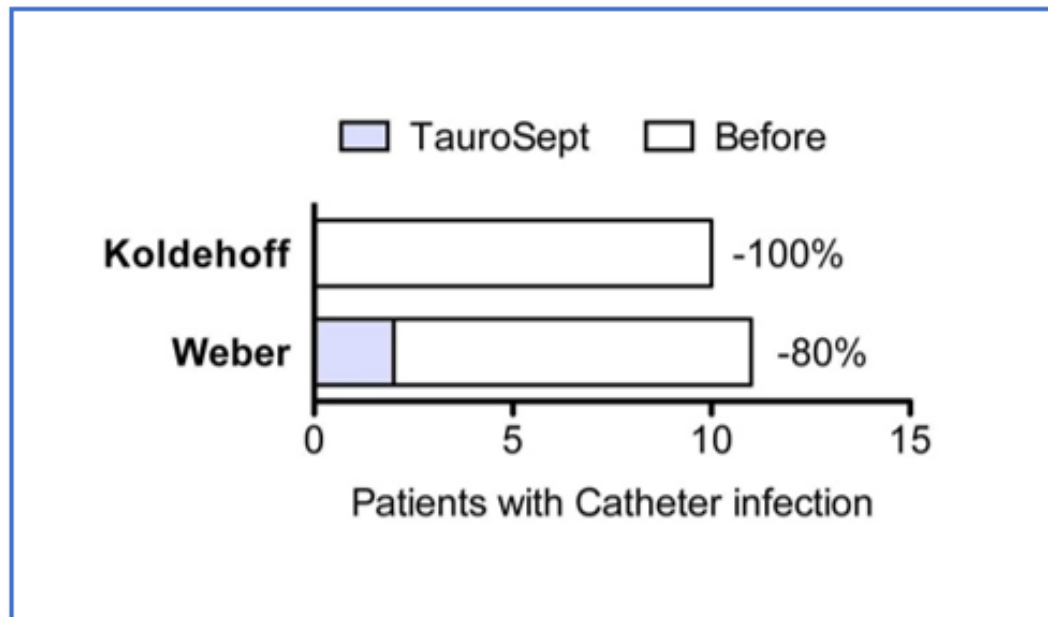


Ampio spettro di azione



Lock terapeutico

Successful treatment of infected catheters



Staph. aureus

E. Coli

Pseudomonas picketti

A. baumannii, oxacillin resistant

Coagulase negative *Staph. spp.*

Enterococcus faecalis

Klebsiella pneumoniae

Corynebacterium

Enterobacter cloacae

Pseudomonas aeruginosa

Lock profilattico

Clinical Nutrition (2005) 24, 462–465



2005

Clinical
Nutrition

<http://intl.elsevierhealth.com/journals/clnu>

SHORT REPORT

Taurolidine lock: The key to prevention of recurrent catheter-related bloodstream infections

Brian Jurewitsch*, Khursheed N. Jeejeebhoy

Digestive Diseases Program, St. Michael's Hospital, University of Toronto, 30 Bond St., Toronto, Ont., Canada M5B 1W8

Clin Nutr. 2010 Aug;29(4):464–8. doi: 10.1016/j.clnu.2009.12.005. Epub 2010 Jan 12.

Taurolidine lock is highly effective in preventing catheter-related bloodstream infections in patients on home parenteral nutrition: a heparin-controlled prospective trial.

Bisseling TM¹, Willems MC, Versleijen MW, Hendriks JC, Vissers RK, Wanten GJ.

⊕ Author information

Pazienti in NP domiciliare

10.8 ↓ 0.8/1000 gg catetere

Pazienti in NP domiciliare

Trial randomizzato eparina/taurolidina

↓ 10 vs 1 CRBSI

Lock profilattico

Received: 26 March 2018 | First decision: 27 April 2018 | Accepted: 18 June 2018
DOI: 10.1111/apt.14904



WILEY **AP_oT** Alimentary Pharmacology & Therapeutics

Randomised clinical trial: 2% taurolidine versus 0.9% saline locking in patients on home parenteral nutrition

Y. Wouters¹ | M. Theilla² | P. Singer² | S. Tribler³ | P. B. Jeppesen³ | L. Pironi⁴ | L. Vinter-Jensen⁵ | H. H. Rasmussen⁵ | F. Rahman⁶ | G. J. A. Wanten¹

↓ Riduzione X4
rischio di CRBSI

OPEN ACCESS Freely available online

Taurolidine Lock Solutions for the Prevention of Catheter-Related Bloodstream Infections: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

Yong Liu^{1*}, An-Qiang Zhang², Lin Cao¹, Hong-Tao Xia¹, Jun-Jie Ma¹

6 Trial randomizzati. - 431 pazienti

↓ CRBSI nei pazienti a rischio

Lock del catetere di almeno 30 minuti

In pediatria

Taurolidina 4% + citrato



Taurolidina 2%
senza citrato



Effetti collaterali pressoché assenti

Senso di nausea, sapore metallico in bocca,
reazioni allergiche?

Lock profilattico

HEPATOLOGY AND NUTRITION

Significant Reduction in Central Venous Catheter–related Bloodstream Infections in Children on HPN After Starting Treatment With Taurolidine Line Lock

Chu, Hui-Ping; Brind, Joanne; Tomar, Rajeev; Hill, Susan

Eparina / taurolidina: CRBSI

↓ 8.6 vs 1.1/1000gg catetere

Effects of prophylactic use of taurolidine-citrate lock on the number of catheter-related infections in children under 2 years of age undergoing surgery

M. Łyszkowska   • G. Kowalewski • M. Szymczak • D. Polnik • A. Mikołajczyk • P. Kaliciński

Standard / taurolidina

↓ 16 vs 1 CRBSI

Vantaggi

JVA
ISSN 1129-7298

J Vasc Access 2016; 17 (6): 453-464
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

Clinical Nutrition 32 (2013) 538–542



Contents lists available at SciVerse ScienceDirect

Clinical Nutrition

Journal homepage: <http://www.elsevier.com/locate/clnu>

Original article

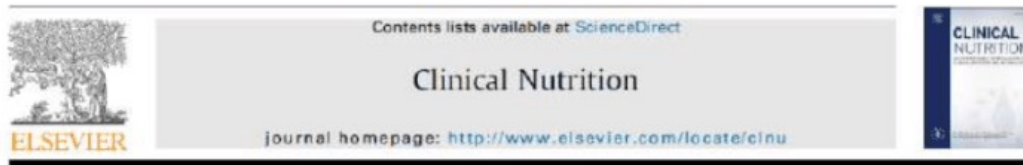
Absence of microbial adaptation to taurolidine in patients on home parenteral nutrition who develop catheter related bloodstream infections and use taurolidine locks☆☆☆

E.D. Olthof^{a,*}, R.J. Rentenaar^b, A.J.M.M. Rijs^b, G.J.A. Wanten^a



Assenza di sviluppo di resistenze
Corta durata di azione

Vantaggi



Original article

Cost-effectiveness of taurolidine locks to prevent recurrent catheter-related blood stream infections in adult patients receiving home parenteral nutrition: a 2-year mirror-image study

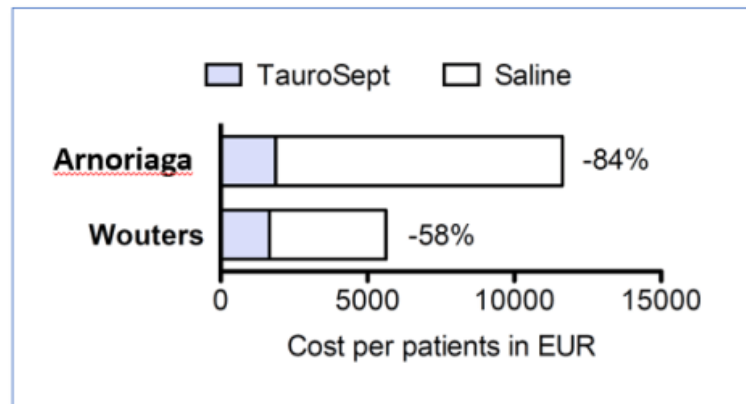
Damien Lannoy^{a, b}, Alexia Janes^a, Xavier Lenne^c, Sébastien Neuville^a, Julien Bourry^d, Pascal Odou^{a, b}, Amélie Bruandet^c, David Seguy^{c, f, d, *}

Clinical and economic impact of the taurolidine lock on home parenteral nutrition

Impacto clínico y económico de la utilización de taurolidina en pacientes con nutrición parenteral domiciliaria

Maria Arnoriaga Rodríguez¹, Maite Pérez de Ciriza Cordeu², Miguel Cambor Álvarez¹, Irene Bretón Lesmes¹, María Motilla de la Cámara¹, Cristina Velasco Gimeno¹, Loredana Arhip^{1, 3}, Pilar García Peris¹ and Cristina Cuerda Compés¹

¹Clinical Nutrition and Dietetics Unit, Hospital General Universitario Gregorio Marañón (HGU/GM), Instituto de Investigación Sanitaria Gregorio Marañón (ISGM), Madrid, Spain. ²Hospital Universitario Donostia, Gipuzkoa, Spain. ³Facultad de Medicina, Universidad Complutense de Madrid, Madrid, Spain



150.000 e nel periodo pre

24.000 nel periodo post



E nel neonato??



Nel neonato



2019 - 2022

37 neonati

21 neonati
Lock terapeutico

16 neonati
Lock profilattico



Imma Savarese

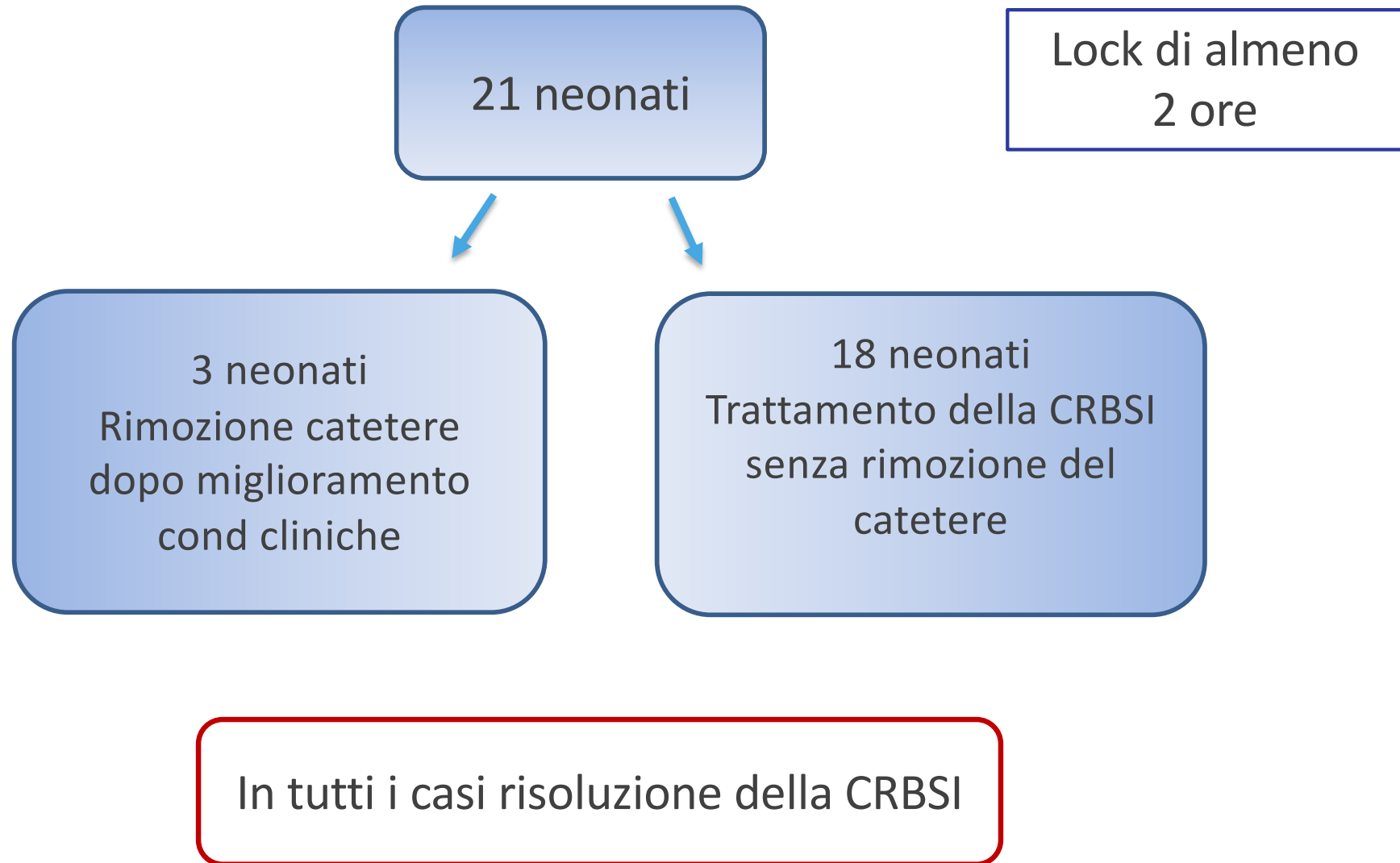
CICC / FICC / CVC a lungo termine

Lock: 0.3 - 0.5 ml



Alla fine del lock riaspirare il contenuto,
altrimenti sciacquare con fisiologica

Lock terapeutico



Lock profilattico



16 neonati



Lock di almeno
30 min

Neonati con fattori di rischio: intestino corto,
prematurità estrema, cardiopatia, chemioterapia

Nessuno sviluppo di CRBSI



1 episodio di conato di vomito dopo il lavaggio del cvc

E il prematuro?

Catetere epicutaneo cava



Difficoltà a chiudere il cvc anche solo per 30 min

Infusioni continue (insulina, farmaci vasoattivi)

Ostruzione del catetere (infusione minima 1ml/h)

Effetto anche anticoagulante

Take home message

La taurolidina

É efficace

É sicura

Economicamente vantaggiosa



Puo essere usata sia per prevenzione che per terapia

Merita un trial clinico randomizzato in età neonatale

Fiammetta.piersigilli@uclouvain.be