

TauroLock™

EFICÁCIA TRIPLA

anti-infeção

anti-oclusão

soluções
TauroLock™

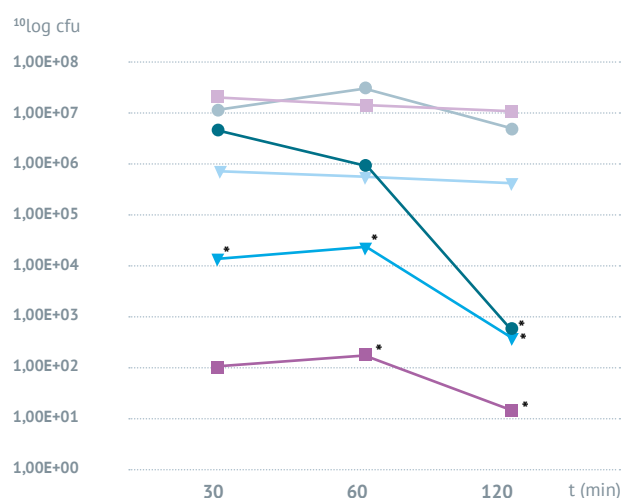
anti-biofilme

TAUROLCKED
LINES SAVE
LIVES

20
YEARS

Soluções antimicrobianas de bloqueio de cateteres com **tripla eficácia** contra a ameaça de biofilme, infecção e mau funcionamento.

1 Prevenção e erradicação de biofilme - in vitro e em doentes



Erradicação do biofilme (ver lit. 7.6)

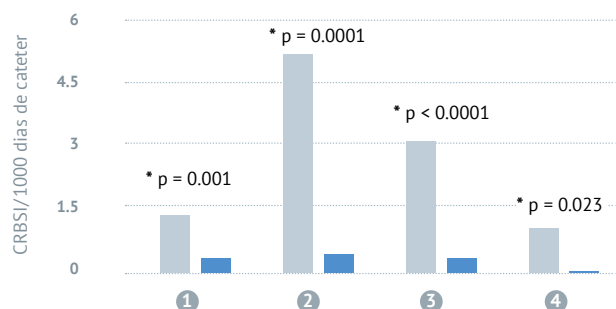
Todos os nossos produtos contêm taurolidina, um agente antimicrobiano que tem sido investigado há décadas em numerosos estudos. A taurolidina provou ser eficaz contra mais de 500 germes: bactérias gram-positivas e gram-negativas, incluindo estirpes resistentes a antibióticos, e também fungos (ver lit. 7.1, acesso através de código QR). Verificou-se que erradica biofilmes de vários germes (ver lit. 7.2; 7.5 e 7.6). Noutro estudo, **TauroLock™** inativou várias estirpes de *S. aureus* (incluindo MRSA) mesmo em biofilme envelhecido (ver lit. 7.4). Este efeito antibiofilme não foi apenas detectado em ensaios in-vitro, mas também em doentes: A taurolidina revelou-se “completamente segura e eficaz” na remoção de bactérias e fungos como *Staphylococci*, *E. coli*, *Enterobacter*, *Pseudomonas aeruginosa*, *Clostridium perfringens* (ver lit. 4.3 e 5.2).

* p ≤ 0.05

S. aureus	P. aeruginosa	C. albicans
— controle	— controle	— controle
— TauroLock™	— TauroLock™	— TauroLock™

2 Prevenção de infecções

Numerosos ensaios clínicos documentam a proteção dos CVCs contra infecções com soluções de bloqueio à base de taurolidina.

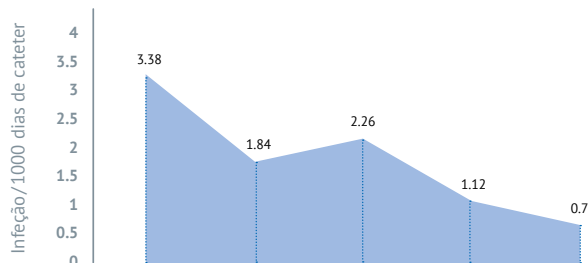


Prevenção de CRBSI com produtos **TauroLock™** em oncologia (1, 2), nutrição parentérica (3), diálise (4)



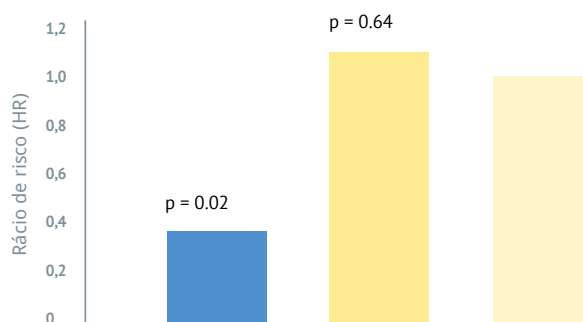
Comparador Produto **TauroLock™**

- 1 **TauroLock™-HEP100** (ver lit. 4.1)
- 2 **TauroLock™** (ver lit. 4.2)
- 3 **TauroLock™-HEP500** (ver lit. 6.4)
- 4 **TauroLock™-HEP500** (ver lit. 3.6)



TIME PERIOD 1999-2002 2003-2006 2007-2010 2011-2014 2015-2017

Inquérito de 19 anos: A incidência de infecção diminuiu de 2,36 por 1.000 dias de cateter para 0,3 por 1.000 dias de cateter (rácio de taxa 7,87, $p < 0,001$). Utilização de **TauroLock™-HEP** a partir de 2002 em pacientes com >3 inf./ano está associada à redução de CRBSI (ver lit. 6.2).



Troca de CVC devido a infecção

Ensaio observacional multicêntrico em HD (ver lit. 3.3)

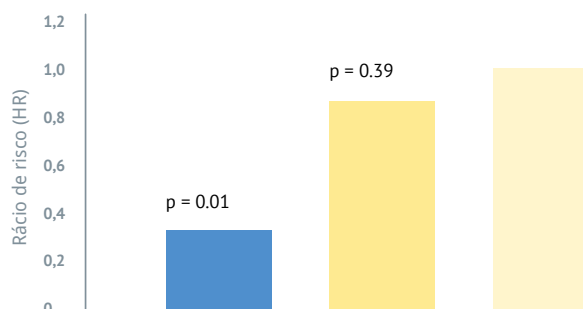
- TauroLock™-HEP500**
- Citrato altamente concentrado (46.7 %)
- Citrato pouco concentrado (4 % e 30 %), definido como referência

3 Prevenção da trombose e oclusão

Todos os produtos **TauroLock™** contêm o anticoagulante citrato (4 %), que é recomendado pela FDA, ERBP, e outros como seguro na prevenção da coagulação sanguínea. Na hemodiálise, muitos doentes necessitam de um efeito anticoagulante mais forte. Foi por esta razão que o **TauroLock™-HEP500** foi desenvolvido: Mantém a patência ainda melhor (ver lit. 3.3; 3.4 e 3.7).

A combinação de um agente antimicrobiano com um anticoagulante foi considerado o mais eficaz (ver lit. 2.4). Os especialistas recomendam um produto combinado: "...os resultados mais promissores são obtidos quando os compostos antibacterianos são adicionados a um bloqueio de citrato ou heparina" (ver secção 2.3).

A eficácia mais forte é obtida com a **adição de uroquinase** trombolítica, como no **TauroLock™- U25.000**, uma abordagem moderna e única (ver itens 3.1 e 3.2).



Troca de CVC devido a mau funcionamento

Ensaio observacional multicêntrico em HD (ver secção 3.3)

- TauroLock™-HEP500**
- Citrato altamente concentrado (46.7 %)
- Citrato pouco concentrado (4 % e 30 %), definido como referência

A formação de biofilme e a coagulação sanguínea devem ser evitadas desde o início devido ao risco de: inflamação silenciosa, trombose, infecção da corrente sanguínea, sucesso insuficiente do tratamento antibiótico ou mesmo resistência aos antibióticos, e trocas de cateteres por infecção ou mau funcionamento.

Mais vale prevenir do que remediar!



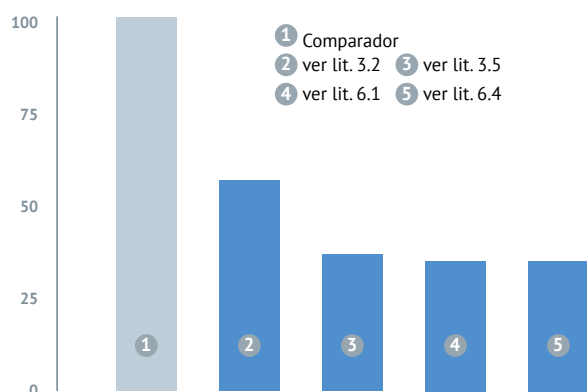
4. Segurança

TauroLock™, TauroLock™-HEP100, TauroLock™-HEP500, e NutriLock™ estão aprovados para uso a partir do nascimento, incluindo crianças neonatais (para dados clínicos ver lit. 4.1; 5.1; 5.2 e 6.3). Para mais pormenores, ver as instruções de utilização.

Os produtos **TauroLock™** também demonstraram melhorar o perfil inflamatório dos doentes (ver lit. 3.6; 3.7 e 3.8).

5. Redução de custos

Os produtos **TauroLock™** não protegem apenas os pacientes contra complicações. Eles também reduzem as despesas associadas ao cateter em comparação com outras soluções de bloqueio.



Custos associados ao cateter, incluindo solução de bloqueio do comparador definido como 100 %



ORIENTAÇÕES



Position statement of European Renal Best Practice (ERBP) 2010

"B.3.1 The preventive use of antimicrobial locks is advocated to reduce the rate of CRBSI... The 46.7 and 30% [citrate] concentration ranges have been considered unsafe. For that reason, the low 4% concentration might be preferred, as also proposed by the American Society of Diagnostic and Interventional Nephrology (ASDIN)."



Guideline of the German Society of Nephrology 2019

"...Blocking with antibacterial lock solutions may be part of measures against overly high bloodstream infections in catheter patients (Cat. IB)...taurolidine and gentamicin exert only antimicrobial effectiveness...
...An additional option is the intermittent (once weekly) use of urokinase in the lock solution (Cat IB)...."



Australian guidelines for haemodialysis catheters

National Health and Medical Research Council (NHMRC) 2015. Print.

Taurolidine has been found to:

- have a very broad-spectrum antimicrobial activity.
- decrease development of biofilms
- be associated with a reduced CRBSI rate compared to heparin



GAVeCeLT consensus 2016

"...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."



INS 2024

61.B.8.d.i. Taurolidine was effective in prevention of catheter-related bloodstream infections (CR-BSIs) for patients on HPN... (I)



ESPEN guideline on home parenteral nutrition 2020

Recommendation 34: As an additional strategy to prevent CRBSIs, taurolidine locking should be used because of its favorable safety and cost profile. Grade of Recommendation B - Strong consensus (100% agreement)

Fabricante:



TauroPharm GmbH

August-Bebel-Straße 51
D-97297 Waldbüttelbrunn

Tel. +49 931 30 42 99 0
Fax +49 931 30 42 99 29

Distribuidor:

Publications on safety and efficacy

1. GUIDELINES AND RECOMMENDATIONS

1.1. Infusion Therapy Standards of Practice 2024

Nickel et al. *J Infus Nurs* 2024. DOI: 10.1097/NAN.0000000000000532

1.2. Diagnosis, prevention and treatment of haemodialysis catheter-related bloodstream infections (CRBSI): a position statement of European Renal Best Practice (ERBP)

Vanholder et al. *NDT Plus* 2010. DOI: 10.1093/ndtplus/sfq041

1.3. Guideline for infection prevention and hygiene 2019 in addition to the German dialysis standard

German Society of Nephrology (Deutsche Gesellschaft für Nephrologie, DGfN) 2019. Print.

1.4. Australian guidelines for haemodialysis catheters

National Health and Medical Research Council (NHMRC) 2015. Print.

1.5. FDA issues warning on tricitrasol dialysis catheter anticoagulant

Food and Drug Administration, U.S. Department of Health and Human Services. 2000. Print.

1.6. 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

Pittiruti et al. *J Vasc Access* 2016. DOI: 10.5301/jva.5000576

1.7. ESPEN guideline on home parenteral nutrition

Pironi et al. *Clin Nutr* 2020. DOI: 10.1016/j.clnu.2020.03.005

1.8. ESPGHAN/ESPEN/ESPR/CSPEN guidelines on pediatric parenteral nutrition: Venous access

Kolaček et al. / ESPGHAN/ESPEN/ESPR/CSPEN working group on pediatric parenteral nutrition. *Clin Nutr* 2018. DOI: 10.1016/j.clnu.2018.06.952

1.9. Prevention of infections related to central-venous catheters – for patients, adults and children, receiving short- or long-term parenteral nutrition (SFNCM)

Schneider et al. *French Society for Clinical Nutrition and Metabolism (SFNCM)* 2019. Print.

2. META-ANALYSES, REVIEW, SURVEY

2.1. Meta-analysis of the efficacy of taurolidine in reducing catheter-related bloodstream infections for patients receiving parenteral nutrition

Vernon-Roberts et al. *J Parenter Enterol Nutr* 2022. DOI: 10.1002/jpen.2363

2.2. A multi-national survey of experience and attitudes towards managing catheter related blood stream infections for home parenteral nutrition

Joly et al. *Clin Nutr ESPEN* 2023 doi: 10.1016/j.clnesp.2023.06.032.

2.3. Any use for alternative lock solutions in the prevention of catheter-related blood stream infections?

Labriola et al. *J Vasc Access* 2017 Mar 6;18(Suppl. 1):34-38. DOI: 10.5301/jva.5000681.

2.4. Citrate versus heparin lock for hemodialysis catheters: a systematic review and meta-analysis of randomized controlled trials

Zhao et al. *Am J Kidney Dis* 2014. DOI: 10.1053/j.ajkd.2013.08.016

3. CLINICAL STUDIES: DIALYSIS

3.1. Safety and efficacy of taurolidine/urokinase versus taurolidine/heparin as a tunneled catheter lock solution in hemodialysis patients: a prospective, randomized, controlled study

Al Ali et al. *Nephrol Dial Transplant* 2018. DOI: 10.1093/ndt/gfx187

3.2. Taurolidine-based catheter lock regimen significantly reduces overall costs, infection, and dysfunction rates of tunneled hemodialysis catheters

Winnicki et al. *Kidney Int* 2018. DOI: 10.1016/j.kint.2017.06.026

3.3. The best solution down the line: an observational study on taurolidine- versus citrate-based lock solutions for central venous catheters in hemodialysis patients

Van Roeden et al. *BMC Nephrology* 2021. DOI: 10.1186/s12882-021-02519-3

3.4. Observational study of need for thrombolytic therapy and incidence of bacteremia using taurolidine-citrate-heparin, taurolidine-citrate and heparin catheter locks in patients treated with hemodialysis

Solomon et al. *Semin Dial* 2012. DOI: 10.1111/j.1525-139X.2011.00951.x

3.5. A new haemodialysis catheter-locking agent reduces infections in haemodialysis patients

Taylor et al. *J Ren Care* 2008. DOI: 10.1111/j.1755-6686.2008.00027.x

3.6. Tunneled catheters with taurolidine-citrate-heparin lock solution significantly improve the inflammatory profile of hemodialysis patients

Fontseré et al. *Antimicrob Agents Chemother* 2014. DOI: 10.1128/AAC.02421-14

3.7. Effect of taurolidine citrate and unfractionated heparin on inflammatory state and dialysis adequacy in hemodialysis patients

Ezzat et al. *J Vasc Access* 2023. DOI: 10.1177/11297298211023295

3.8. Patients on HD with central catheters locked with taurolidine have a similar inflammatory profile to subjects with native arterio-venous fistula

Navarro-González et al. *Nephrol Dial Transplant* 2023. DOI:10.1093/ndt/gfad063b_3195

4. CLINICAL STUDIES: ONCOLOGY/HAEMATOLOGY

4.1. Central venous catheters and catheter locks in children with cancer: a prospective randomized trial of taurolidine versus heparin
[Handrup et al. *Pediatr Blood Cancer* 2013. DOI: 10.1002/pbc.24482](#)

4.2. Taurolidine-Citrate Line Locks Prevent Recurrent Central Line-Associated Bloodstream Infection in Pediatric Patients
[Clark et al. *Pediatr Infect Dis J* 2019. DOI: 10.1097/INF.0000000000002191](#)

4.3. Taurolidine lock in the treatment of colonization and infection of totally implanted venous access devices in cancer patients
[Brescia et al. *J Vasc Access* 2023. DOI: 10.1177/11297298211026453](#)

5. CLINICAL STUDIES: INTENSIVE CARE

5.1. Effects of prophylactic use of taurolidine-citrate lock on the number of catheter-related infections in children under 2 years of age undergoing surgery
[Łyszkowska et al. *J Hosp Infect* 2019. DOI: 10.1016/j.jhin.2019.04.022](#)

5.2. Use of 2% taurolidine lock solution for treatment and prevention of catheter-related bloodstream infections in neonates: a feasibility study
[Savarese et al. *J Hops Infect* 2024. DOI: 10.1016/j.jhin.2023.11.003](#)

6. CLINICAL STUDIES: PARENTERAL NUTRITION

6.1. Taurolidine-citrate-heparin lock reduces catheter-related bloodstream infections in intestinal failure patients dependent on home parenteral support: a randomized, placebo-controlled trial
[Tribler et al. *Am J Clin Nutr* 2017. DOI: 10.3945/ajcn.117.158964](#)

6.2. The incidence and management of complications of venous access in home parenteral nutrition (HPN): A 19 year longitudinal cohort series
[Leiberman et al. *Clin Nutr ESPEN* 2020. DOI: 10.1016/j.clnesp.2020.03.025](#)

6.3. Strategies to Reduce Catheter-Related Bloodstream Infections in Pediatric Patients Receiving Home Parenteral Nutrition: The Efficacy of Taurolidine-Citrate Prophylactic-Locking
[Lambe et al. *Parenter Enteral Nutr* 2018. DOI: 10.1002/jpen.1043.](#)

6.4. 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
[Lannoy et al. *Clin Nutr* 2021. DOI: 10.1016/j.clnu.2021.01.017](#)

7. STUDIES: IN VITRO AND BIOFILM

7.1. Activities of taurolidine in vitro and in experimental enterococcal endocarditis
[Torres-Viera et al. *Antimicrob Agents Chemother* 2000. DOI: 10.1128/AAC.44.6.1720-1724.2000](#)

7.2. Antimicrobial activity of a novel catheter lock solution
[Shah et al. *Antimicrob Agents Chemother* 2002. DOI: 10.1128/AAC.46.6.1674-1679.2002](#)

7.3. Microbiocidal effects of various taurolidine containing catheter lock solutions
[Olthof et al. *Clin Nutr.* 2015. DOI: 10.1016/j.clnu.2014.04.023](#)

7.4. In Vitro Approach for Identification of the Most Effective Agents for Antimicrobial Lock Therapy in the Treatment of Intravascular Catheter-Related Infections Caused by *Staphylococcus aureus*
[Hogan et al. *Antimicrob Agents Chemother* 2016. DOI: 10.1128/AAC.02885-15](#)

7.5. Antimicrobial activity of hemodialysis catheter lock solutions in relation to other compounds with antiseptic properties
[Pjatkowska et al. *PLoS ONE* 2021. DOI: 10.1371/journal.pone.0258148](#)

7.6. In vitro comparison of the effectiveness of various antimicrobial locks with taurolidine in the treatment and prevention of catheter-related bloodstream infections in patients receiving parenteral nutrition
[Víšek et al. *Nutrition* 2023. DOI: 10.1016/j.nut.2023.112115](#)