

# Controle de Infecção no Serviço de Diálise

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HOSPITAL  
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# Sem conflitos de interesse

# Assuntos abordados

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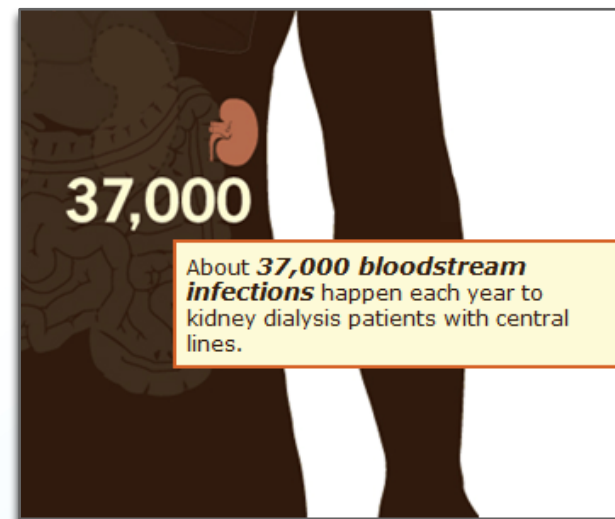
- Problemática das Infecções nos pacientes dialíticos
- Identificar/rever as evidências para reduzir as IRAS nos serviços de diálise
- Principais medidas de intervenção (cuidados com fistula e CVC)
- Auditorias sugeridas
- Novos produtos/soluções
- Envolvimento do paciente no cuidados

# Problemática

Infecção de corrente sanguínea:

- A segunda causa de morte entre os pacientes dialíticos – depois doenças vasculares
- Nos EUA: 370.000 pacientes em hemodiálise crônica
  - 75.000 através do CVC
- Custo por cada infecção - US\$20,000
- 25% das ICS-CVC por *S. aureus* – endocardite ou osteomielite
- 20% com ICS-CVC morrem em até 12 semanas

<http://www.cdc.gov/nhsn/dialysis/>;  
Am J Kidney Dis. 2013; 61(1)(suppl 1):e1-e480



# Por que os pacientes em diálise tem maior risco de infecção?

Frequente uso do cateter ou inserção de agulha para acessar a corrente sanguínea

Proximidade com outros pacientes

Imunossuprimidos

Internações hospitalares frequentes

# Infecções mais comuns nos pacientes dialíticos

- **Relacionada a diálise:**

- Infecção da Corrente Sanguínea (ICS)-principal cateter não tunelizado
- Infecção no local acesso vascular (IAV)
- Infecções virais

- **Não relacionadas à diálise:**

PNM, ITU, Pele, outras


==== REDUCING TUNNELED HEMODIALYSIS CATHETER MORBIDITY ====

Infection Associated with Tunneled  
Hemodialysis Catheters

Gerald A. Beathard and Aris Urbanes

**TABLE 1. Judging CRB rates**

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< 1/1000 catheter days—Excellent	
1–2/1000 catheter days—Good	
3–5/1000 catheter days—Fair	
6–7/1000 catheter days—Poor	
> 7/1000 catheter days—Really bad	

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CRB, catheter-related bacteremia.

# Vital Signs: Central Line--Associated Blood Stream Infections --- United States, 2001, 2008, and 2009

*Weekly*

March 4, 2011 / 60(08);243-248



**TABLE 2. Estimated annual number of central line--associated blood stream infections (CLABSIs), by health-care setting and year --- United States, 2001, 2008, and 2009**

Health-care setting	Year	No. of infections (upper and lower bound of sensitivity analysis)
Intensive-care units	2001	43,000 (27,000--67,000)
	2009	18,000 (12,000--28,000)
Inpatient wards	2009	23,000 (15,000--37,000)
Outpatient hemodialysis*	2008	37,000 (23,000--57,000)

\* Case definitions approximate current definition of CLABSI according to the National Healthcare Safety Network.

## Hemodialysis CLABSI rate data

Pooled mean access-related bloodstream infection rate in hemodialysis patients with a central line, 2008	3.20 per 100 patient-months (equivalent to 1.05 per 1,000 central line-days)	National Healthcare Safety Network, 2007--2008
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## Avaliado 6005 centros de dialise em 2014

**Table 2. Pooled means and percentiles of the distribution of rates of key dialysis events by type of vascular access (Dialysis Event Surveillance, National Healthcare Safety Network, 2014)**

Type and Access	Events	Denominator	Pooled Mean	Percentile				
				10th	25th	50th	75th	90th
<b>All bloodstream infection</b>	29,516	4,578,827	0.64	0	0.25	0.53	0.91	1.42
Fistula	7587	2,876,871	0.26	0	0	0.15	0.39	0.72
Graft	3262	827,821	0.39	0	0	0	0.55	1.33
Other	76	15,016	0.51	0	0	0	0	0
CVC	18,591	859,119	2.16	0	0.53	1.68	3.23	5.26
<b>Access-related bloodstream infection</b>	22,576	4,578,827	0.49	0	0.16	0.39	0.7	1.13
Fistula	4518	2,876,871	0.16	0	0	0	0.24	0.47
Graft	2256	827,821	0.27	0	0	0	0.23	0.98
Other	49	15,016	0.33	0	0	0	0	0
CVC	15,753	859,119	1.83	0	0	1.33	2.78	4.71
<b>Intravenous antimicrobial start</b>	149,722	4,578,792	3.27	1.08	1.91	2.97	4.25	5.88
Fistula	59,532	2,876,851	2.07	0.3	0.89	1.72	2.78	4.08
Graft	21,770	827,809	2.63	0	0.53	2.05	3.8	6.11
Other	433	15,016	2.88	0	0	0	0	9.09
CVC	67,993	859,116	7.91	2.26	4.55	7.48	11.25	15.63

CVC combines tunneled CVC and nontunneled CVC. Pooled mean rate = (total number of events/total number of patient-months) × 100. Percentiles are on the basis of the distribution of individual facility rates per 100 patient-months. All rates are reported per 100 patient-months. CVC, central venous catheter.

**Table 3. Most frequently reported micro-organisms isolated from blood cultures (Dialysis Event Surveillance, National Healthcare Safety Network, 2014)**

Pathogen	Frequency, N (%)	
	All BSI, n=32,016	ARBSI, n=24,574
<b>Ten most common pathogens</b>		
<i>Staphylococcus aureus</i>	9788 (30.6)	7817 (31.8)
<i>Staphylococcus epidermidis</i>	4690 (14.6)	3837 (15.6)
<i>Staphylococcus coagulase negative</i>	3212 (10.0)	2389 (9.7)
<i>Enterococcus faecalis</i>	1535 (4.8)	1194 (4.9)
<i>Escherichia coli</i>	1193 (3.7)	720 (2.9)
<i>Enterobacter cloacae</i>	891 (2.8)	782 (3.2)
<i>Klebsiella pneumoniae</i>	880 (2.7)	640 (2.6)
Gram-positive cocci unspecified	689 (2.2)	509 (2.1)
<i>Pseudomonas aeruginosa</i>	638 (2.0)	486 (2.0)
<i>Serratia marcescens</i>	421 (1.3)	351 (1.4)
<b>Other pathogens</b>		
<i>Proteus mirabilis</i>	354 (1.1)	244 (1.0)
<i>Acinetobacter baumannii</i>	289 (0.9)	244 (1.0)
<i>Stenotrophomonas maltophilia</i>	288 (0.9)	257 (1.0)
<i>Enterococcus faecium</i>	219 (0.7)	159 (0.6)
<i>Candida parapsilosis</i>	58 (0.2)	52 (0.2)
<i>Burkholderia cepacia</i>	54 (0.2)	40 (0.2)
<i>Ralstonia picketti</i>	12 (<0.1)	11 (<0.1)

57%

# Distribuição das taxas em Percentil segundo serviços de HD em 2017



187 Serviços	Taxa Média p/serviço	Percentil				
		10%	25%	50% (mediana)	75%	90%
<b>Infecção acesso Vascular p/ 100 pac-mês</b>						
C. temporário	5,96	0,00	0,00	2,84	8,20	14,79
C. permanente	4,03	0,00	0,68	2,99	5,68	9,29
Fistula	0,45	0,00	0,00	0,23	0,56	1,18
<b>Infecção acesso Vascular p/ 1000 CVC-dia</b>						
C. Temporário	1,98	0,00	0,00	0,95	2,73	4,93
C. Permanente	1,34	0,00	0,23	1,00	1,89	3,10
<b>Bacteremia p/100 pac-mês</b>						
C. Temporário	5,22	0,00	0,00	3,94	7,65	13,15
C. Permanente	4,02	0,28	1,32	3,10	5,72	9,02
Fistula	0,22	0,00	0,00	0,09	0,23	0,41
<b>Bacteremia p/ 1000 CVC-dia</b>						
C. Temporário	1,75	0,00	0,00	1,39	2,56	4,40
C. Permanente	1,34	0,09	0,44	1,03	1,91	3,01
Taxa de Pacientes que receberam Vancomicina (%)	2,96	0,41	0,95	1,95	3,47	5,74



**Agência Nacional  
de Vigilância Sanitária**

**Nota Técnica nº 06/2017  
GVIMS/GGTES/ANVISA:**

**Sistema Nacional de Vigilância  
Epidemiológica das Infecções  
Relacionadas à Assistência à Saúde  
em Serviços de Diálise**

Gerência de Vigilância e Monitoramento em Serviços de Saúde - GVIMS

Gerência Geral de Tecnologia em Serviços de Saúde - GGTES

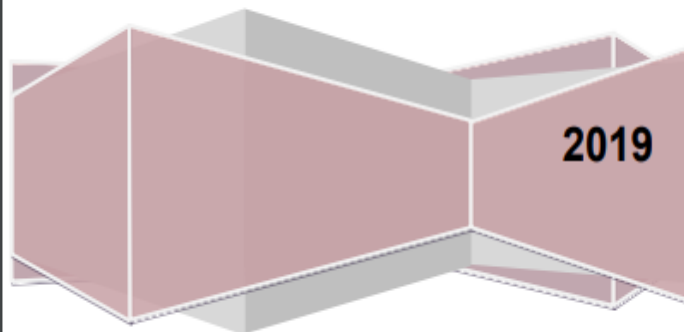


SECRETARIA DE ESTADO DA SAÚDE DE SÃO PAULO  
COORDENADORIA DE CONTROLE DE DOENÇAS - CCD  
CENTRO DE VIGILÂNCIA EPIDEMIOLÓGICA "PROF. ALEXANDRE VRANJAC"  
DIVISÃO DE INFECÇÃO HOSPITALAR

## **MANUAL DE ORIENTAÇÕES E CRITÉRIOS DIAGNÓSTICOS**

### **SERVIÇOS DE DIÁLISE**

### **SISTEMA DE VIGILÂNCIA EPIDEMIOLÓGICA DAS INFECÇÕES HOSPITALARES DO ESTADO DE SÃO PAULO**



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**HOSPITAL  
SÍRIO-LIBANÊS**

Desde  
2014

## Infecção do Acesso Vascular (IAV)

Hemocultura negativa ou não colhida E PELO MENOS  
UM dos critérios:

**Critério 1:** saída de pus

**Critério 2:** dor, rubor, edema no local acesso.

**Observações:**

1. Incluir as infecções de orifício de saída, túnel, cateter, fístula e fístula com enxerto.
2. Deve haver 21 dias de diferença entre os episódios de infecção do acesso vascular para ser considerado como novo evento.

## Bacteremia Associada ao Acesso Vascular

**Pacientes sintomáticos** (febre, calafrios, choque, etc) COM:

- **Hemocultura positiva (colhida de veia periférica ou das linhas de hemodiálise ou do cateter)**
- **E ausência de sinais ou sintomas em outros sítios (pneumonia, infecção do trato urinário, etc.)**

**Obs:** Deve haver 21 dias de diferença entre hemoculturas positivas com o mesmo agente para ser considerado novo evento

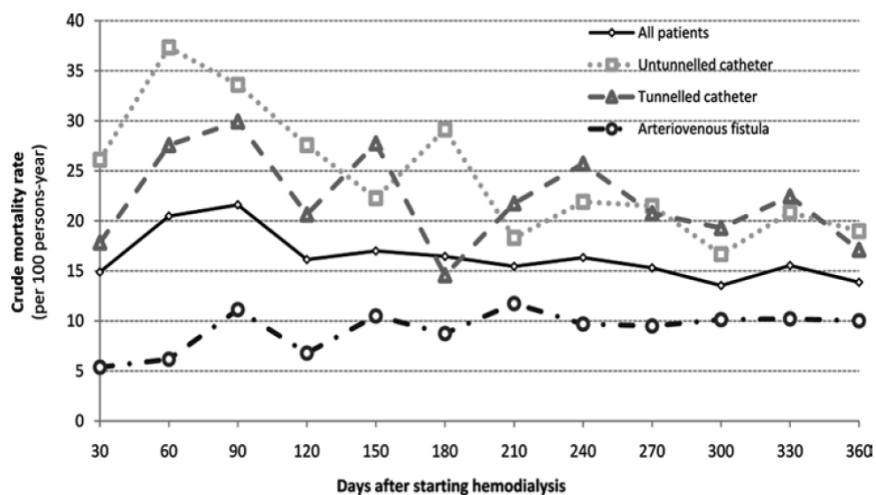
The Clinical Practice Guidelines published by NKF (98) recommend that the following CDC definitions be used:

- *Definite bloodstream infection*: the same organism from a semiquantitative culture of the catheter tip (> 15 colony-forming units per catheter segment) and from a peripheral or catheter blood sample in a symptomatic patient with no other apparent source of infection.
- *Probable bloodstream infection*: defervescence of symptoms after antibiotic therapy with or without removal of catheter, in the setting in which blood cultures confirm infection, but catheter tip does not (or catheter tip does, but blood cultures do not) in a symptomatic patient with no other apparent source of infection.
- *Possible bloodstream infection*: defervescence of symptoms after antibiotic treatment or after removal of catheter in the absence of laboratory confirmation of bloodstream infection in a symptomatic patient with no other apparent source of infection.

NKF-K/DOQI: Clinical Practice Guidelines for Vascular Access  
[http://www.kidney.org/professionals/KDOQI/guideline\\_upHD\\_PD\\_VA/index.htm](http://www.kidney.org/professionals/KDOQI/guideline_upHD_PD_VA/index.htm)

# Starting hemodialysis with catheter and mortality risk: persistent association in a competing risk analysis

Ramon Roca-Tey<sup>1,2</sup>, Emma Arcos<sup>3</sup>, Jordi Comas<sup>3</sup>, Higinio Cao<sup>3,4</sup>, Jaume Tort<sup>3</sup>, and the Catalan Renal Registry Committee<sup>3</sup>



Registro de 9956 pacientes na Catalonia

9956 pacientes em HD	Fistula	CVC tunelizado e nao tunelizado
Mortalidade de todas as causas	2,97 (2,17-4,06)	3,66 (2,8-4,81)
Morte por Causas cardiovasculares	1,84 (1,17-2,89)	2,76 (1,9-4,01)
Infecção	4,58 (2-10,52)	6,62(3,11-14,05)

Priorize fistula

J Vasc Access 2016; 17 (1): 20-28

# Principais medidas de prevenção

Inserção

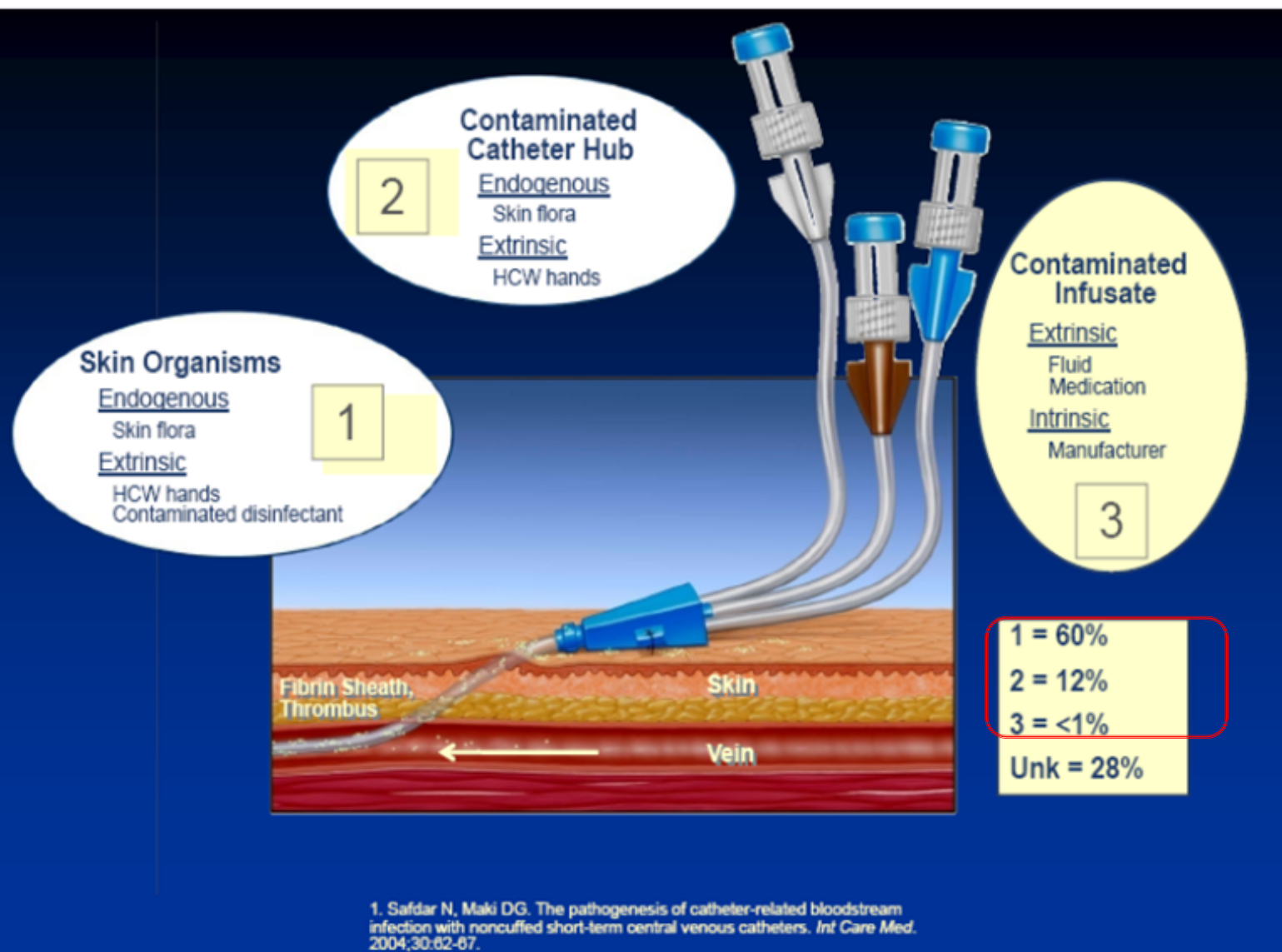
Manipulação

Curativo

Cuidado com o ambiente







# Quais as melhores práticas?

## 9 intervenções principais:

- Vigilância das infecções e feedback
- Observação de HM
- Auditoria de processo (cateter e fístula)
- Avaliação das competências dos PAS
- Engajamento do paciente
- Reduzir a utilização de CVC
- Clorexidina alcoólica na anti-sepsia da pele
- Desinfecção do hub/conector
- Pomada de antimicrobiano

## 2 intervenções práticas:

- Injeção segura
- Limpeza ambiental

### CDC Approach to BSI Prevention in Dialysis Facilities

(I.e., the Core Interventions for Dialysis Bloodstream Infection (BSI) Prevention)

#### 1. Surveillance and feedback using NHSN

Conduct monthly surveillance for BSIs and other dialysis events using CDC's National Healthcare Safety Network (NHSN). Calculate facility rates and compare to rates in other NHSN facilities. Actively share results with front-line clinical staff.

#### 2. Hand hygiene observations

Perform observations of hand hygiene opportunities monthly and share results with clinical staff.

#### 3. Catheter/vascular access care observations

Perform observations of vascular access care and catheter accessing quarterly. Assess staff adherence to aseptic technique when connecting and disconnecting catheters and during dressing changes. Share results with clinical staff.

#### 4. Staff education and competency

Train staff on infection control topics, including access care and aseptic technique. Perform competency evaluation for skills such as catheter care and accessing every 6-12 months and upon hire.

#### 5. Patient education/engagement

Provide standardized education to all patients on infection prevention topics including vascular access care, hand hygiene, risks related to catheter use, recognizing signs of infection, and instructions for access management when away from the dialysis unit.

#### 6. Catheter reduction

Incorporate efforts (e.g., through patient education, vascular access coordinator) to reduce catheters by identifying and addressing barriers to permanent vascular access placement and catheter removal.

#### 7. Chlorhexidine for skin antisepsis

Use an alcohol-based chlorhexidine (>0.5%) solution as the first line skin antiseptic agent for central line insertion and during dressing changes.\*

#### 8. Catheter hub disinfection

Scrub catheter hubs with an appropriate antiseptic after cap is removed and before accessing. Perform every time catheter is accessed or disconnected.\*\*

#### 9. Antimicrobial ointment

Apply antibiotic ointment or povidone-iodine ointment to catheter exit sites during dressing change.\*\*\*

\* Povidone-iodine (preferably with alcohol) or 70% alcohol are alternatives for patients with chlorhexidine intolerance.

\*\* If closed needleless connector device is used, disinfect device per manufacturer's instructions.

\*\*\* See information on selecting an antimicrobial ointment for hemodialysis catheter exit sites on CDC's Dialysis Safety website (<http://www.cdc.gov/dialysis/prevention-tools/core-interventions.html#sites>). Use of chlorhexidine-impregnated sponge dressing might be an alternative.

For more information about the Core Interventions for Dialysis Bloodstream Infection (BSI) Prevention, please visit <http://www.cdc.gov/dialysis>

National Center for Emerging and Zoonotic Infectious Diseases  
Division of Healthcare Quality Promotion



<https://www.cdc.gov/dialysis/index.html>

# Higiene de mãos

## O desafio da separação espacial

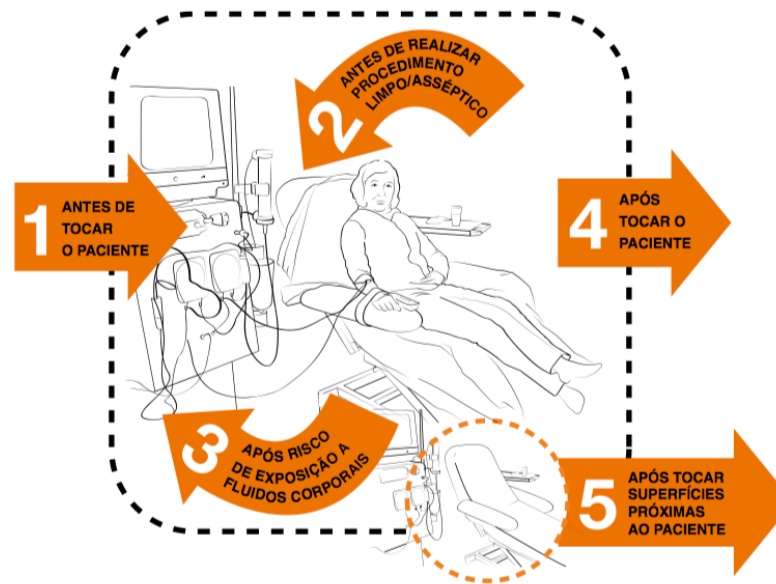
- Falta de barreiras físicas ou separação significativa entre estações.
- Onde termina o espaço de um paciente e começa do outro?



FIGURA 9

Cartaz da OMS sobre as indicações para a higiene das mãos durante uma sessão de hemodiálise no atendimento ambulatorial

## Seus 5 Momentos para a Higiene das Mãos Hemodiálise no atendimento ambulatorial



<b>1</b>	<b>ANTES DE TOCAR O PACIENTE</b>	<b>Quando</b> Higienizar as mãos antes de tocar o paciente. <b>Por que</b> Para proteger o paciente contra os micro-organismos carreados em suas mãos.
<b>2</b>	<b>ANTES DE REALIZAR PROCEDIMENTO LIMPO/ASSÉPTICO</b>	<b>Quando</b> Higienizar as mãos imediatamente antes da realização de procedimento limpo/asséptico. <b>Por que</b> Para proteger o paciente contra os micro-organismos, inclusive os do próprio paciente.
<b>3</b>	<b>APÓS RISCO DE EXPOSIÇÃO A FLUIDOS CORPORAIS</b>	<b>Quando</b> Higienizar as mãos imediatamente após um procedimento com risco de exposição a fluidos corporais (e após a remoção de luvas). <b>Por que</b> Para proteger a si próprio e o ambiente contra os micro-organismos do paciente.
<b>4</b>	<b>APÓS TOCAR O PACIENTE</b>	<b>Quando</b> Higienizar as mãos imediatamente após tocar o paciente, ao finalizar o cuidado ou quando o cuidado for interrompido. <b>Por que</b> Para proteger a si próprio e o ambiente contra os micro-organismos do paciente.
<b>5</b>	<b>APÓS CONTATO COM AS ÁREAS PRÓXIMAS AO PACIENTE</b>	<b>Quando</b> Higienizar as mãos após tocar quaisquer objetos ou mobiliário nas áreas próximas ao paciente, quando uma área específica está temporariamente e exclusivamente destinada a um paciente – ainda que não tenha ocorrido contato com ele. <b>Por que</b> Para proteger a si próprio e o ambiente contra micro-organismos do paciente.

## SALVE VIDAS

Higienize **suas** Mãos

### Higiene das Mãos na Assistência à Saúde Extra-hospitalar e Domiciliar e nas Instituições de Longa Permanência

Um Guia para a Implementação da Estratégia Multimodal da OMS para a Melhoria da Higiene das Mãos e da Abordagem "Meus 5 Momentos para a Higiene das Mãos"



#### Sequência de cuidados

A. O paciente chega, coloca seus pertences sobre a mesa de cabeceira; lava o braço e, ainda, é feita verificação do

peso. O paciente retorna e deita-se na cama ou senta-se na poltrona enquanto a enfermeira chega com a máquina preparada para utilização. Ela usa avental, máscara e óculos de proteção.

**A enfermeira realiza a higiene das mãos (Momento 1)**

B. A enfermeira verifica os sinais vitais, pede o resultado do peso, verifica a condição da fistula, ajuda o paciente a se conectar à máquina e coloca uma proteção debaixo do braço do paciente.

C. A enfermeira registra os dados na ficha do paciente e a coloca em cima da máquina de diálise.

D. A enfermeira liga a máquina.

**A enfermeira realiza a higiene das mãos (Momento 2)**

E. A enfermeira abre o kit para a punção em cima da mesa de cabeceira, verte o antisséptico, prepara a agulha e alguns tubos para a coleta de sangue, se necessário, e, em seguida, preenche as seringas e acrescenta as compressas.

**A enfermeira realiza a higiene das mãos (Momento 2)**

F. A enfermeira calça as luvas estéreis e aplica o antisséptico no local de punção (local da fistula arteriovenosa) com o instrumental.

G. A enfermeira insere a primeira agulha, lava e faz a fixação, conectando o circuito de diálise, e repete o procedimento com a segunda agulha.

H. A enfermeira ajusta a máquina.

I. A enfermeira recolhe o kit de punção e remove e descarta as luvas na lixeira.

**A enfermeira realiza a higiene das mãos (Momento 3)**

J. A enfermeira verifica novamente os sinais vitais, registra os dados e retira um livro de sua bolsa que está sobre a mesa de cabeceira, oferecendo-o ao paciente.

**A enfermeira realiza a higiene das mãos (Momento 4)**

## SALVE VIDAS

Higienize **suas** Mãos

Higiene das Mãos na Assistência à Saúde Extra-hospitalar e Domiciliar e nas Instituições de Longa Permanência

Um Guia para a Implementação da Estratégia Multimodal da OMS para a Melhoria da Higiene das Mãos e da Abordagem "Meus 5 Momentos para a Higiene das Mãos"



### Hemodiálise- sequência de cuidados:

- Higieniza as mãos: auxiliar paciente na poltrona/cama (2)
  - Higieniza as mãos: sinais vitais/avalia condições do acesso (2)
  - Parametros da maquina/anotações (2)
  - Higieniza as mãos: abri kit de punção (1)
  - Higieniza as mãos: manipular acesso/fistula (2)
  - Higieniza as mãos: sinais vitais/anotações (2)
- 
- **Número mínimo de higienizações das mãos: 11 x1,2=13,2 ml/atendimento**





# Educação/avaliação do conhecimento do profissional

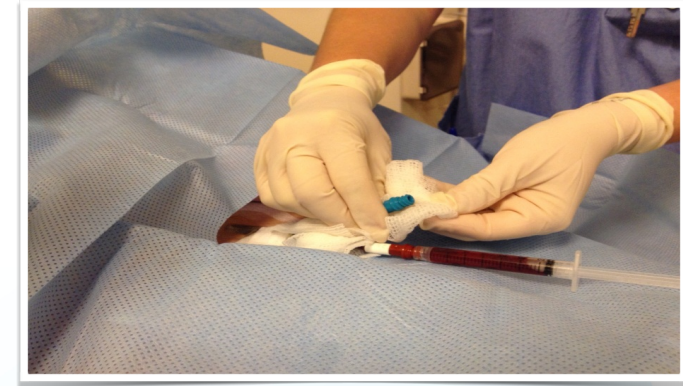
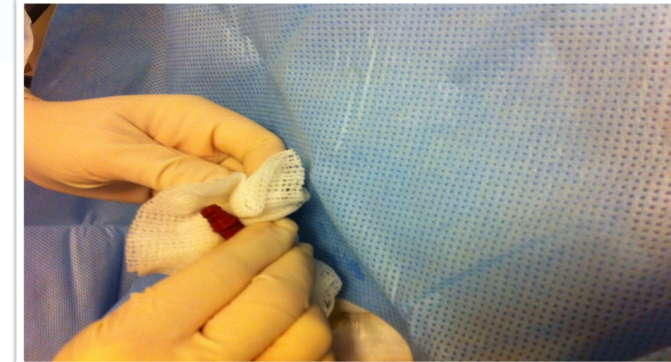
# 1. Cuidados na inserção

- Paramentação máxima estéril do profissional ao inserir o cateter
- Campo ampliado cobrindo o paciente
- Uso de clorexidina alcoólica  $>0,5\%$



## 2. Cuidados para conectar e desconectar o cateter de diálise

- HH imediatamente antes de manipular o CVC e logo após
- Realize todo o procedimento com técnica-aseptica
- Devem ser usadas luvas novas e limpas para este procedimento e removidas imediatamente
- Sempre clampar o cateter antes de retirar a tampa
  - Nunca deixe o cateter sem tampa
- Sempre manipule o cateter de forma aséptica
  - A ponta do cateter não deve tocar superfície não esteril
- Minimizar o número de vezes e a duração de desconexão das linhas de sangue

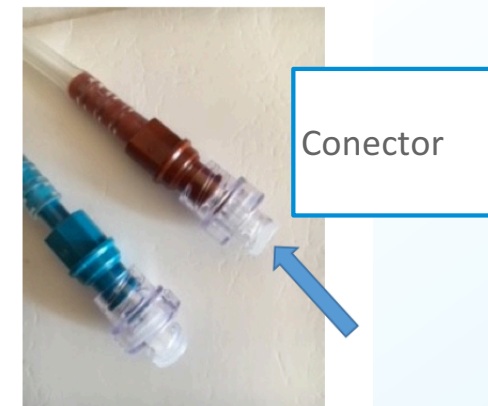
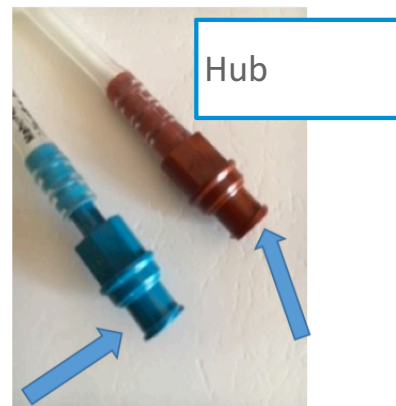
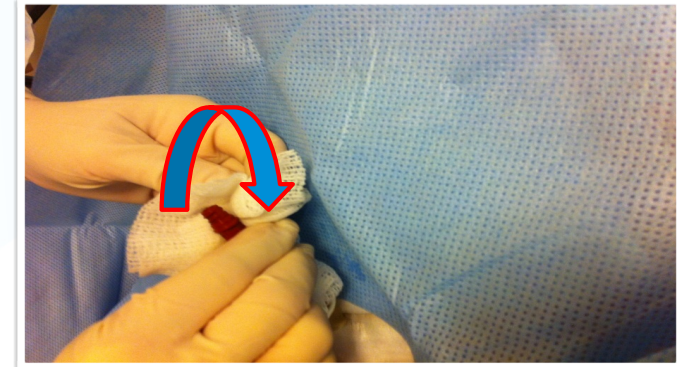


## 2. Cuidados para conectar e desconectar o cateter de dialise

Desinfecção do conector/hub com antisséptico alcoólico por no mínimo 5 segundos

Defina:

- Passos para conectar
- Passos para desconectar
- Escolha do antisséptico
- Técnica do processo



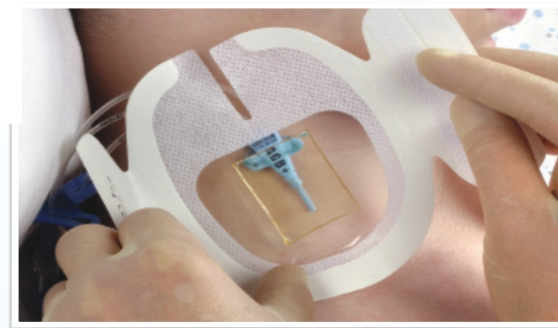
### 3. Cuidados com a fistula-canulação e decanulação

- Estimular o paciente a higienizar a fistula antes da punção
- HM do PAS antes e após manipular a fistula
- Aplicar o antisséptico alcoólico e esperar secar antes de puncionar
- Luvas novas e limpas para comprimir o local do acesso



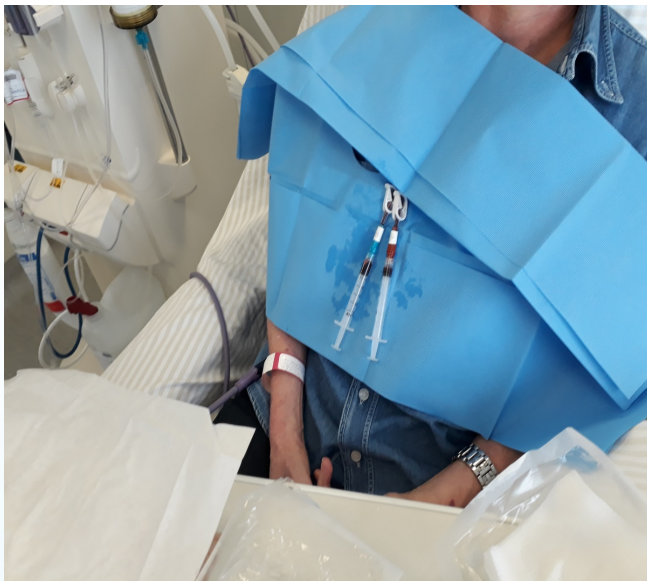
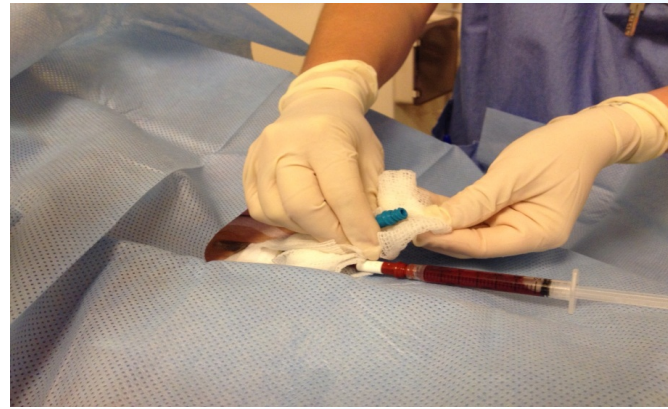
## 4. Cuidados na realização do curativo

- Utilizar curativo impregnado com clorexidina
- Orientar o paciente a proteger o curativo no banho
- Use pomada:
  - Povidone-iodine ointment or
  - Bacitracin/gramicidin/polymyxin B ointment (not available in U.S.)
  - Bacitracin/neomycin/polymyxin B ointment (Triple antibiotic) may be an acceptable alternative
  - Use curativo impregnado com clorexidina como alternativa
  - <https://www.cdc.gov/infectioncontrol/guidelines/bsi/index.html>









# Auditorias de processo

# Higiene das mãos

**CDC Dialysis Collaborative** Facility Name: \_\_\_\_\_ Date: \_\_\_\_\_ Start time: \_\_\_\_\_ AM / PM  
 Day: M W F Tu Th Sa Shift: 1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup> 4<sup>th</sup> Observer: \_\_\_\_\_ Location within unit: \_\_\_\_\_

## **Audit Tool: Hemodialysis hand hygiene observations**

(Use a "✓" for each 'hand hygiene opportunity' observed. Under 'opportunity successful', use a "✓" if successful, and leave blank if not successful)

Discipline	Hand hygiene		Describe any missed attempts (e.g., during medication prep, between patients, after contamination with blood, etc.):
	Hand hygiene opportunity	Opportunity successful	

Discipline: **P**=physician, **N**=nurse, **T**=technician, **S**=student, **D**=dietitian, **W**=social worker, **O**=other

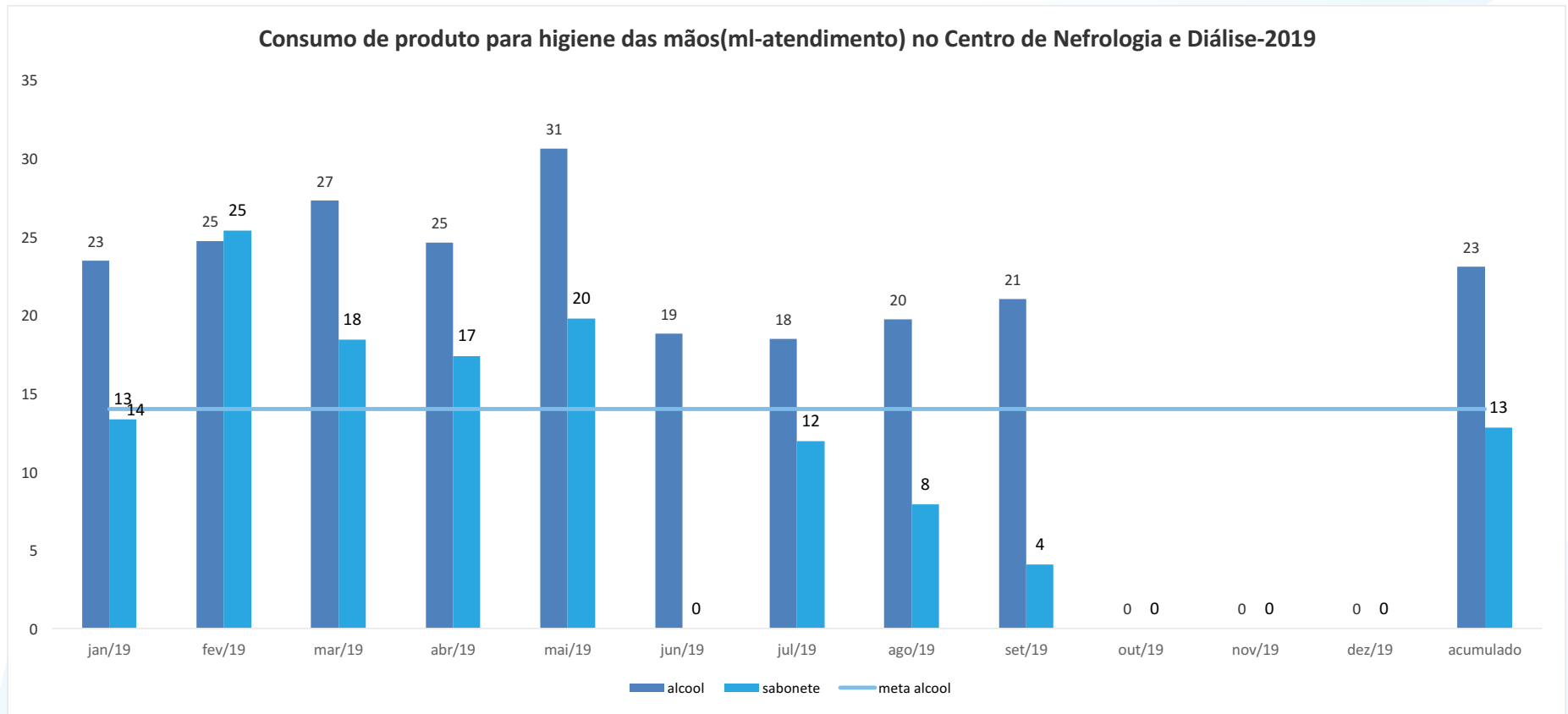
Duration of observation period = \_\_\_\_\_ minutes Number of successful hand hygiene opportunities observed = \_\_\_\_\_

Total number of patients observed during audit = \_\_\_\_\_ Total number of hand hygiene opportunities observed during audit = \_\_\_\_\_

\*\* See hand hygiene opportunities on back page



Meta: 14ml-atendimento



# Checklist conexão e desconexão do CVC

**CDC Dialysis Collaborative** Facility Name: \_\_\_\_\_ Date: \_\_\_\_\_ Start time: \_\_\_\_\_ AM / PM  
 Day: M W F Tu Th Sa Shift: 1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup> 4<sup>th</sup> Observer: \_\_\_\_\_ Location within unit: \_\_\_\_\_

## Audit Tool: Catheter connection and disconnection observations

(Use a "√" if action performed correctly, a "Φ" if not performed. If not observed, leave blank)

Procedure observed, C=connect D=disconnect	Discipline	Mask worn properly (if required)	Hand hygiene performed	New clean gloves worn	Catheter removed from blood line aseptically (disconnection only)	Catheter hub scrubbed	Hub antiseptic allowed to dry	Catheter connected to blood lines aseptically (connection only)	New caps attached aseptically (after disconnecting)	Gloves removed	Hand hygiene performed

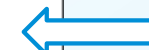
Discipline: **P**=physician, **N**=nurse, **T**=technician, **S**=student, **O**=other

Duration of observation period = \_\_\_\_\_ minutes

Number of procedures performed correctly = \_\_\_\_\_

Total number of procedures observed during audit = \_\_\_\_\_

### ADDITIONAL COMMENTS/OBSERVATIONS:



# Desinfecção do conector - *Scrub de hub*

## Hemodialysis Central Venous Catheter Scrub-the-Hub Protocol

This protocol outlines a suggested approach to preparing catheter hubs prior to accessing the catheter for hemodialysis. It is based on evidence where available and incorporates theoretical rationale when published evidence is unavailable.

### Definitions:

**Catheter** refers to a central venous catheter (CVC) or a central line.

**Hub** refers to the end of the CVC that connects to the blood lines or cap.

**Cap** refers to a device that screws on to and occludes the hub.

**Limb** refers to the catheter portion that extends from the patient's body to the hub.

**Blood lines** refer to the arterial and venous ends of the extracorporeal circuit that connect the patient's catheter to the dialyzer.

### Catheter Connection and Disconnection Steps:

#### Connection Steps

1. Perform hand hygiene and don new clean gloves.
2. Clamp the catheter (Note: **Always** clamp the catheter before removing the cap. Never leave an uncapped catheter unattended).
3. Disinfect the hub with caps removed using an appropriate antiseptic (see notes).
  - a. (Optional) Prior to cap removal, disinfect the caps and the part of the hub that is accessible and discard the antiseptic pad (i.e., use a separate antiseptic pad for the next step).
  - b. Remove the caps and disinfect the hub with a new antiseptic pad for each hub. Scrub the sides (threads) and end of the hub thoroughly with friction, making sure to remove any residue (e.g., blood).
  - c. Using the same antiseptic pad, apply antiseptic with friction to the catheter, moving from the hub at least several centimeters towards the body. Hold the limb while allowing the antiseptic to dry.
  - d. Use a separate antiseptic pad for each hub/catheter limb. Leave hubs "open" (i.e., uncapped and disconnected) for the shortest time possible.

4. Always handle the catheter hubs aseptically. Once disinfected, do not allow the catheter hubs to touch nonsterile surfaces.
5. Attach sterile syringe, unclamp the catheter, withdraw blood, and flush per facility protocol.
6. Repeat for other limb (this might occur in parallel).
7. Connect the ends of the blood lines to the catheter aseptically.
8. Remove gloves and perform hand hygiene.

#### Disconnection Steps:

1. Perform hand hygiene and don new clean gloves.
2. Clamp the catheter (Note: **Always** clamp the catheter before disconnecting. Never leave an uncapped catheter unattended).
3. Disinfect the catheter hub before applying the new cap using an appropriate antiseptic (see notes).
  - a. (Optional) Disinfect the connection prior to disconnection. If this is done, use a separate antiseptic pad for the subsequent disinfection of the hub.
  - b. Disconnect the blood line from the catheter and disinfect the hub with a new antiseptic pad. Scrub the sides (threads) and end of the hub thoroughly with friction, making sure to remove any residue (e.g., blood).
  - c. Use a separate antiseptic pad for each hub. Leave hubs "open" (i.e., uncapped and disconnected) for the shortest time possible.
4. Always handle the catheter hubs aseptically. Once disinfected, do not allow the catheter hubs to touch nonsterile surfaces. Hold the catheter until the antiseptic has dried.
5. Attach the new sterile caps to the catheter aseptically. Use caution if tape is used to secure caps to the catheter (see notes).
6. Ensure that catheter is still clamped.
7. Remove gloves and perform hand hygiene.



National Center for Emerging and Zoonotic Infectious Diseases  
Division of Healthcare Quality Promotion



### Notes/Discussion:

#### Antiseptic Use and Selection

As described in the 2011 CDC/Healthcare Infection Control Practices Advisory Committee (HICPAC) Guidelines for the Prevention of Intravascular Catheter-Related Infections, prior to accessing the catheter hub it should be disinfected with an appropriate antiseptic (greater than 0.5% chlorhexidine with alcohol, 70% alcohol, or 10% povidone-iodine). There is not enough evidence to recommend one antiseptic over the others. Generally, antiseptics should be allowed to dry for maximal effect.

If using 70% alcohol, sterile antiseptic pads should be used (sterile pads are labeled sterile and packaging for nonsterile pads often does not state whether the pads are sterile or nonsterile). For practical reasons, pads or similar products might be preferred over other forms of antiseptics (e.g., swabs) for disinfecting the catheter as they are malleable and allow for vigorous cleaning of small spaces.

If using an antiseptic that leaves a residue (e.g., chlorhexidine), avoid allowing large amounts of antiseptic to enter the lumen of the catheter to avoid potential toxicities to the patient.

If using chlorhexidine, removing all blood residue is particularly important to maximize the effect of the antiseptic.

#### Soaking Caps

The role of soaking caps in an antiseptic prior to removing them is not clear. It is not a CDC/HICPAC recommendation. This procedure is described in the 2000 National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (KDOQI) Vascular Access Guidelines but was not included in the 2006 update.

#### Handling Catheter Hubs

Catheter hubs should always be handled aseptically. Once disinfected, the catheter hubs should not be allowed to touch nonsterile surfaces. This might be best performed by holding them until the antiseptic dries. During this time, the staff member performing the procedure should also ensure that the catheter remains clamped.

When disinfecting catheter hubs, clean, nonsterile gloves can be used if aseptic technique is maintained.

#### Bloodline Disinfection

When accessing the line, disinfecting the ends of the sterile blood lines is not required if care has been taken not to contaminate the ends of the blood lines (i.e., through careful aseptic technique). Blood lines can become contaminated during connections and disconnections, as well as during the priming process. Contact with contaminated prime waste in prime buckets that have not been properly cleaned and disinfected or through backflow from waste handling ports must be avoided. Disinfecting the bloodlines does not address this issue.

#### Disconnection and Line Reversals

Catheter hubs should be disinfected again after disconnecting from bloodlines and before replacing a new cap at the end of a treatment. This should be done in a manner similar to that used when disinfecting the hub prior to accessing. Disinfecting the catheter hub and the end of the extracorporeal blood line should also be performed if, during a treatment, a patient must be disconnected and their blood is re-circulated. Anytime a patient's circuit is disconnected this should be done aseptically and the number of times a patient's catheter is disconnected from the blood lines should be minimized to the extent possible.

#### Securing Caps with Tape

Caution should be used if taping caps on to hubs between treatments. Tape can leave residue on the hubs that might make disinfecting them more difficult.

#### Use of Masks

Although data supporting the use of masks during catheter accessing/disaccessing to prevent vascular access infections is lacking, this practice is recommended for patients and staff in the 2000 KDOQI guidelines and is included in the Centers for Medicare and Medicaid Services (CMS) End Stage Renal Disease Program Conditions for Coverage Interpretive Guidance.

#### Personal Protective Equipment (PPE)

Proper PPE should always be worn by staff to avoid exposure to potentially infectious blood and body fluids when connecting/disconnecting catheters.

#### Aseptic Technique

This includes practices that prevent the contamination of clean/sterile items and surfaces. Once tasks requiring aseptic technique have been started, care must be taken to avoid contamination of gloves and other clean/sterile items that can occur when touching dirty surfaces (e.g., positioning patient, using computer keyboard).

#### Selected References:

1. National Kidney Foundation. KDOQI Clinical Practice Guidelines and Clinical Practice Recommendations for 2006 Updates: Hemodialysis Adequacy, Peritoneal Dialysis Adequacy and Vascular Access. *Am J Kidney Dis* 2006; 48 (suppl 1):S1-S322.
2. National Kidney Foundation. KDOQI Clinical Practice Guidelines for Hemodialysis Adequacy, 2000. *Am J Kidney Dis* 2001; 37 (suppl 1):S7-S64.
3. O'Grady NP, Alexander M, Burns LM, et al. Guideline for the prevention of intravascular catheter-related infections. *Clin Infect Dis* 2011; 52:e163-e195.

# Curativo do CVC

## **Audit Tool: Catheter exit site care observations**

(Use a "√" if action performed correctly, a "Ø" if not performed. If not observed, leave blank)

Discipline	Mask worn properly (if required)	Hand hygiene performed	New clean gloves worn	Skin antiseptic applied appropriately	Skin antiseptic allowed to dry	No contact with exit site (after antiseptics)	Antimicrobial ointment applied	Dressing applied aseptically	Gloves removed	Hand hygiene performed	Comments

Discipline: **P**=physician, **N**=nurse, **T**=technician, **S**=student, **O**=other

Duration of observation period: \_\_\_\_\_ minutes

Number of procedures performed correctly = \_\_\_\_\_

Total number of procedures observed during audit = \_\_\_\_\_

### **ADDITIONAL COMMENTS/OBSERVATIONS:**



# Canulação e decanulação-fistula

**CDC Dialysis Collaborative** Facility Name: \_\_\_\_\_ Date: \_\_\_\_\_ Start time: \_\_\_\_\_ AM / PM

Day: M W F Tu Th Sa Shift: 1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup> 4<sup>th</sup> Observer: \_\_\_\_\_ Location within unit: \_\_\_\_\_

## **Audit Tool: Arteriovenous fistula/graft cannulation observations**

(Use a "√" if action performed correctly, a "Ø" if not performed. If not observed, leave blank)

Discipline	Site cleaned with soap and water	Hand hygiene performed (staff)	New, clean gloves worn	Skin antiseptic applied appropriately	Skin antiseptic allowed to dry	No contact with fistula/graft site (after antiseptics)	Cannulation performed aseptically	Connect to blood lines aseptically	Gloves removed	Hand hygiene performed	Comments

Discipline: P=physician, N=nurse, T=technician, S=student, O=other

Duration of observation period = \_\_\_\_\_ minutes

Number of procedures performed correctly = \_\_\_\_\_

Total number of procedures observed during audit = \_\_\_\_\_

**ADDITIONAL COMMENTS/OBSERVATIONS:**



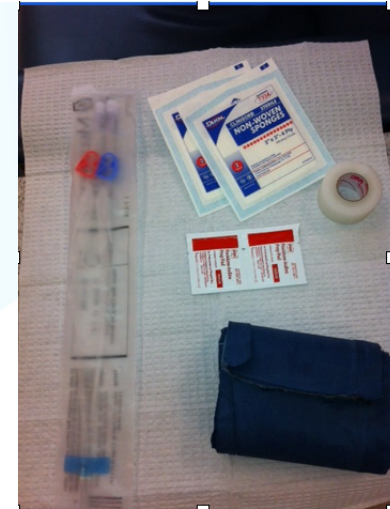
**E O AMBIENTE?**

# Ambiente

- Áreas limpas: usadas para a preparação, manuseio e armazenamento de medicamentos e suprimentos e equipamentos não utilizados.
- Áreas contaminadas: suprimentos e equipamentos utilizados não limpos
- **Lembre-se: Estações de tratamento são áreas contaminadas!**

Os itens levados para a estação de diálise devem ser:

1. Eliminado ou
2. Limpo e desinfetado antes de ser levado a uma área limpa comum ou usado em outro paciente
3. Medicamentos ou suprimentos não utilizados levados ao posto do paciente não devem ser devolvidos a uma área limpa comum (por exemplo, frascos de medicamentos, seringas, amostras de álcool)



# Limpeza do ambiente

- **Superfícies que devem ser limpas:**
  - Todas as superfícies em contato com o paciente e frequentemente tocadas pelos PAS
    - Focar a limpeza em superfícies de alto contato:
      - Cadeira de dialise
      - Mesa de apoio
      - Aparelho de pressão arterial
        - Parte lateral da máquina de dialise, tela Touchscreens, painel de controle e teclados
        - bancadas



# Cuidado com o ambiente

Facility Name: \_\_\_\_\_ Observer: \_\_\_\_\_  
 Date: \_\_\_\_\_ Day: M W F Tu Th Sa Shift: 1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup> 4<sup>th</sup> Start time: \_\_\_\_\_ AM / PM

## Audit Tool: Hemodialysis station routine disinfection observations\*

(Use a "√" if action performed correctly, a "Φ" if not performed/ performed incorrectly. If not observed, leave blank. All applicable actions within a row must have "√" for the procedure to be counted as successful.)

\*This audit tool applies when there is no visible soil on surfaces at the dialysis station. If visible blood or other soil is present, surfaces must be cleaned prior to disinfection.

Discipline	All supplies removed from station and prime bucket emptied	Gloves removed, hand hygiene performed	Station is empty before disinfection initiated**	New clean gloves worn	Disinfectant applied to all surfaces and prime bucket	All surfaces are wet with disinfectant	All surfaces allowed to dry	Gloves removed, hand hygiene performed	No supplies or patient brought to station until disinfection complete

Discipline: P=physician, N=nurse, T=technician, S=student, O=other

Duration of observation period: \_\_\_\_\_ Number of procedures performed correctly = \_\_\_\_\_  
 Total number of procedures observed during audit = \_\_\_\_\_

### ADDITIONAL COMMENTS/OBSERVATIONS:

\*\* Ensure the patient has left the dialysis station before disinfection is initiated.

# Injeção segura

- Prepare todas as doses individuais do paciente em uma área limpa longe das estações de diálise
- Prepare as doses o mais próximo possível do tempo de uso
- Não transporte medicamentos de estação para estação
- Não prepare ou armazene medicamentos nas estações de pacientes
- Use frascos de dose única sempre que possível e elimine-os imediatamente após o uso

<https://www.cdc.gov/dialysis/index.html>



# Preparo da medicação – injeção segura

Facility Name: \_\_\_\_\_ Observer: \_\_\_\_\_  
 Date(s): \_\_\_\_\_ Location of Medication Preparation: \_\_\_\_\_

## **Audit Tool:** Hemodialysis injectable medication preparation

Observe a medication preparation session. (Use a “V” if action performed correctly, a “Φ” if not performed/performed incorrectly. If not observed, leave blank. All applicable actions within a row must have “V” for the procedure to be counted as successful.)

Day (i.e., M, Tu, W)	Shift (i.e., 1-4)	Discipline	Med prep done in designated area	Med prep area is clean *	All vial(s) are inspected **	Hand hygiene performed	Septum of all vial(s) disinfected	All vials entered with new needle and new syringe	Med prep done aseptically	All single dose vial(s) discarded	All multi dose vial(s) discarded or stored properly

Discipline: P=physician, N=nurse, T=technician, S=student, O=other

Number of sessions performed correctly = \_\_\_\_\_

Total number of sessions observed = \_\_\_\_\_

**ADDITIONAL COMMENTS/OBSERVATIONS:**

# Vacinas-pacientes

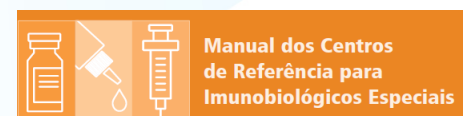
## VACCINES AND DIALYSIS

What You Need to Know

VACCINES RECOMMENDED FOR ADULTS ON DIALYSIS*	
Vaccine	Dosage
Flu (influenza)	1 dose per year
Hepatitis B virus (HBV)	3 doses Ask your healthcare provider about timing and dosage**
Hepatitis A virus (HAV)	2 doses
Pneumococcal Pneumonia (2 types of vaccines)	1 or 2 doses Ask your healthcare provider about timing and spacing
Tetanus, diphtheria, pertussis (Td/Tdap)	1-time dose of Tdap, then Td booster every 10 years
Varicella (Chickenpox)	1 dose
Meningococcal (meningitis)	Use if needed, 1 or more doses (dependent on patient)

\*Centers for Disease Control and Prevention (CDC)

\*\*People on dialysis might need more shots or a higher dose.



### Vacinação anti-hepatite B em outros grupos especiais

Renais crônicos, hemodialisados	Quatro doses com o dobro da dose para a idade, esquema de zero/1/2/6 meses	Sim. Repetir esquema para os não reagentes. Retestar anualmente e fazer reforço para os que apresentarem títulos menores que 10 UI/mL na retestagem
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# Vacinas-profissional de saúde

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- SCR
- Influenza
- Hepatite B
- Varicela

Centers for Disease Control and Prevention. Immunization of Health-Care Workers: Recommendations of the Advisory Committee on Immunization Practices (ACIP) and the Hospital Infection Control Practices Advisory Committee (HICPAC).



# Educação do paciente

## Patients with Catheters



# 6 TIPS

to prevent  
Dialysis  
Infections

U.S. Department of  
Health and Human Services  
Centers for Disease  
Control and Prevention

[www.cdc.gov/ckd](http://www.cdc.gov/ckd) [www.cdc.gov/dialysis/patient](http://www.cdc.gov/dialysis/patient)



### TIP 1

Catheters have a higher risk of infection. Ask your doctor about getting a fistula or graft instead.



### TIP 2

Learn how to take care of the catheter at home. Do not get it wet.



### TIP 3

Wash your hands often, especially before and after dialysis treatment.



### TIP 4

Know the steps your healthcare providers should take when using the catheter for treatment.



### TIP 5


Know the signs and symptoms of infection and what to do if you think you might have an infection.



### TIP 6

Know what to do if you have any problem with the catheter.

## Patients with Fistulas or Grafts



# 6 TIPS

to prevent  
Dialysis  
Infections

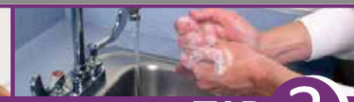
U.S. Department of  
Health and Human Services  
Centers for Disease  
Control and Prevention

[www.cdc.gov/ckd](http://www.cdc.gov/ckd) [www.cdc.gov/dialysis/patient](http://www.cdc.gov/dialysis/patient)



### TIP 1

Take care of your dialysis access site at home. Avoid scratching or picking it.



### TIP 2

Wash your hands often, especially before and after dialysis treatment.



### TIP 3

Wash or cleanse your dialysis access site prior to treatment.



### TIP 4

Know the steps your healthcare providers should take when using your dialysis access for treatment.



### TIP 5

Know the signs and symptoms of infection and what to do if you think you might have an infection.



### TIP 6

Know what to do if you have any problem with your dialysis access site.

# **NOVOS PRODUTOS/SOLUÇÕES**

# Tampas (caps) para dialise



Am J Infect Control 2008;36(10):S174e1-S174e5  
Am J Infect Control 2011;39(4):309-313.  
Am J Infect Control 2013;41(1):33-38.

Use an antiseptic-containing hub/connector cap/port protector to cover connectors (quality of evidence: I).<sup>161-165</sup>

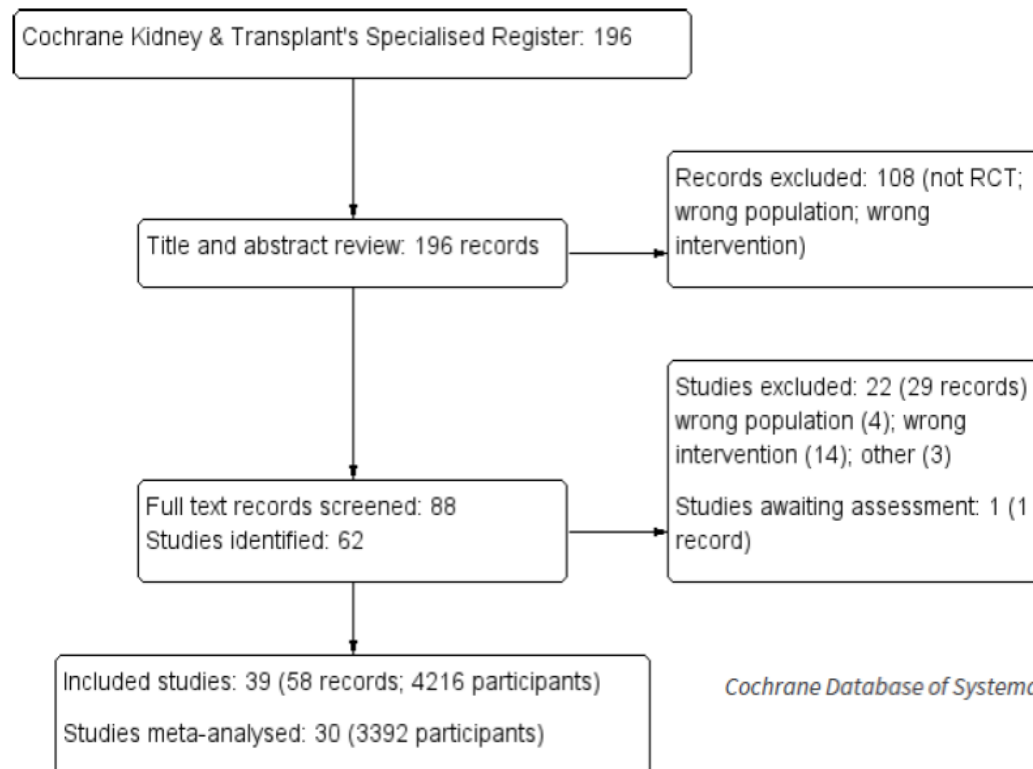
# Antimicrobial lock solutions for preventing catheter-related infections in haemodialysis (Review)

## Objectives

To assess the efficacy and safety of antimicrobial (antibiotic, non-antibiotic, or both) catheter lock solutions for preventing CRI in participants undergoing HD with a CVC.

# Antimicrobial lock solutions for preventing catheter-related infections in haemodialysis (Review)

Figure 1. Study selection flow diagram



*Cochrane Database of Systematic Reviews 2018, Issue 4. Art. No.: CD010597.*

# Antimicrobial lock solutions for preventing catheter-related infections in haemodialysis (Review)

Antimicrobial lock solutions vs control for preventing catheter-related infections in patient undergoing haemodialysis						
Patient or population: CVC-related infection Setting: haemodialysis therapy Intervention: antimicrobial lock solutions Comparison: heparin and other lock solutions						
Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	n <sub>o</sub> of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with heparin and other lock solutions	Risk with antimicrobial lock solutions				
CVC-related infections assessed with: per 1000 days/catheter	Low 43 per 1.000	16 per 1.000 (12 to 23)	RR 0.38 (0.27 to 0.53)	2994 (27 RCTs)	⊕⊕○○ LOW <sup>12345</sup>	

## Authors' conclusions

Antibiotic antimicrobial and combined (antibiotic-non antibiotic) lock solutions decreased the incidence of CRI compared to control lock solutions, whereas non-antibiotic lock solutions reduce CRI only for tunneled CVC. The effect on thrombosis incidence is uncertain for all antimicrobial lock solutions. Our confidence in the evidence is low and very low; therefore, better-designed studies are needed to confirm the efficacy and safety of antimicrobial lock solutions.

## CONCLUSÕES:

- Lock com antimicrobiano ou combinado reduz ICS-CVC quando comparado com heparina
- Melhor efeito quando o antibiotico foi associado a não antibiótico
- Lock com não atb, mostrou melhor resultado no CVC tunelizado
- Em geral, as soluções de lock atb são provavelmente superiores às soluções padrão na prevenção de ICS-CVC entre pacientes submetidos a HD
- O efeito sobre a incidência de trombose é incerto para todas as soluções de bloqueio antimicrobiano
- Mecanismo da ICS é diferente quando comparado tunelizado (via intraluminal) x não tunelizado (via extraluminal).



Lock com antimicrobiano ou combinado reduz ICS-CVC quando comparado com heparina

Melhor efeito quando o antibiótico foi associado a não antibiótico

Lock com não atb, mostrou melhor resultado no CVC tunelizado

O efeito sobre a incidência de trombose é incerto para todas as soluções de bloqueio antimicrobiano

Mecanismo da ICS é diferente quando comparado tunelizado (via intraluminal) x não tunelizado (via extraluminal).

# Legislações

- Cada país tem a sua.
- Atentar para controle água:
  - Potabilidade
  - Controle microbiológico
  - Frequência
- Reutilização de dialisadores
  - Brasil- legislações vigentes:
  - PORTARIA N° 389, DE 13 DE MARÇO DE 2014: Define os critérios para a organização da linha de cuidado da Pessoa com Doença Renal Crônica (DRC) e institui incentivo financeiro de custeio destinado ao cuidado ambulatorial pré-dialítico
  - RESOLUÇÃO DA DIRETORIA COLEGIADA - RDC N° 11, DE 13 DE MARÇO DE 2014: Dispõe sobre os Requisitos de Boas Práticas de Funcionamento para os Serviços de Diálise e dá outras providências

# Sistema de água

## Sistema de água



Filtro de areia: elimina partículas grandes



Abrandador: dureza (ex. Ca e Mg)  
Carvão: cloro, odor, sabor..  
Ultrafiltração: pequenas partículas de carvão

## Sistema de água



Filtro pré-osmose: ultrafiltração

# Sistema de água



Sistema de osmose reversa: sempre em movimento



Ultra violeta

Desinfecção do sistema:  
semestral  
Sirio faz  
quinzenal: hipoclorito e  
ozônio alternadamente



## Osmose portátil



### 3 filtros:

- Resina catiônica
- Partículas
- Carvão
- Frequência de desinfecção: não há na legislação. Seguimos a RDC 2014: sistema de osmose.

# Conclusão

- A implementação de várias práticas baseadas em evidências e a vigilância e educação contínuas podem reduzir as ICS em pacientes em hemodiálise a níveis baixo e sustentado.
- A meta de zero infecção propondo eliminar toda a infecção evitável deve ser prática rotineira de todas as unidades de diálise

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