

Chronic Care of the HD Catheter Exit Site

Key Points

- Guidelines for preventing HD Catheter Exit Site Infection
- Management of exit site infection, treatment and
- Guidelines for empirical and specific organism antibiotic therapy

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Abbreviations

CHG	Chlorhexidine gluconate
BNF	British National Formulary
FBC	Full blood count
CRP	C-Reactive Protein
MC&S	Microscopy culture and sensitivity
HD	haemodialysis
SpR	Senior Registrar
MRSA	Methicillin Resistant Staphylococcus Aureus
MSSA	Methicillin Sensitive Staphylococcus Aureus

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Introduction

- In haemodialysis patients, poor personal hygiene is a risk factor for vascular access site infections. In addition, there is a higher rate of infection in haemodialysis patients when new or inexperienced dialysis staff manipulate the patient's vascular access.
- Catheter infection can occur following transmission of hand or aerosolized bacterial contaminants. Bacteraemia and tunnel tract infections are the leading causes of catheter loss.
- Gram-positive organisms are responsible for most catheter-related infections. Staphylococcal infection accounts for 40 to 81 percent in reported studies. The remainder are due predominantly to enterococci and Gram negative rods^{1,2}

Guidelines for chronic care of the exit-site

1. During catheter connection and disconnection procedures, nurses should wear sterile gloves, a surgical mask or face shield; **and patients** should wear a surgical mask.
2. Examine the catheter exit site at each haemodialysis session for signs of infection. ***Use the exit site scoring system and enter the assessment on CV5 (See Appendix 1).***
3. Tegaderm with CHG is to be used at the exit site for all catheters at each exit site dressing change. Dressing should be changed once weekly, or at the start of the dialysis session if it is clinically indicated (soiled, very blood stained, etc).
4. For catheters that have been in for longer than 2 weeks, clean the catheter exit site with 2% Chlorhexidine in 70% alcohol (Chloraprep). [By this time, the catheter exit site should have healed, such that there should be minimal discomfort from the alcohol component of the Chloraprep]. Within the first 2 weeks of catheter insertion, cleaning with an alcohol-based preparation such as Chloraprep could cause quite a bit of discomfort and if this occurs, we would recommend that Betadine is used and then as soon as is possible, this is switched to Chloraprep.
5. Clean the hub of the catheter with the cap on for 30 seconds with a 2% Chlorhexidine in 70 % alcohol wipe. Each hub should be cleaned with a single wipe. Once the cap is removed, if the end of the line is contaminated, clean the end of the line with 2% Chlorhexidine in 70 % alcohol wipe for 30 seconds and allow at least 30 seconds to air dry.
6. The exit site dressing will be observed and evaluated using ***the exit site scoring system*** at each haemodialysis session. If the dressing is clean, then the Tegaderm with CHG dressing is to be changed as a routine after 7 days. If the dressing is soiled, or the patient complains of pain or tenderness around the exit site, the dressing will be removed to permit complete visualization and assessment (using the exit site score). The exit site will then be cleaned as per protocol, Tegaderm with CHG applied. If the patient is allergic to TEGADERM with CHG, MEPORE or gauze and tape can be used. The dressing must be dated to clearly indicate that it will be routinely changed 7 days following that date.

Rationale

Chronic haemodialysis patients are at increased risk of *S. aureus* nasal carriage. Nasal carriage may result in seeding of the skin with *S. aureus*, leading to catheter site infection, tunnel track infection, or bacteraemia.

Catheter placement near the patient's nose and mouth, such as occurs with jugular vein catheters, exposes the patient's catheter exit site to nasal drainage/discharge and infectious airborne droplets. MRSA may be transmitted in this mode.

Catheter dressing changes and manipulation place the patient at risk for infection.

A surgical mask worn by the patient and nurse any time the catheter is accessed reduces the spread of infectious droplets and reduces contamination of the catheter site.

In the first two weeks, use of alcohol containing solutions for exit-site care is likely to cause a lot of discomfort for the patient as the exit-site will not have healed. In these cases, Betadine should be used to clean and then a Tegaderm dressing should be placed.

Treatment of exit-site infections – See scoring system

- 1 Inspect the exit-site and enter the score on CV5 and on the Dialysis Summary Chart, using the scoring system. On dialysis sessions where a routine dressing change is not required/indicated, the absence of pain or tenderness, or of any visible swelling must be documented on the CV5 HD exit-site assessment section.
- 2 If the score is 4 or greater, send off a swab for Microscopy, Culture and Sensitivity.
- 3 Empirical antibiotic treatment should be:
 - Oral Flucloxacillin 500mg qds (use Clarithromycin 250mg bd or Doxycycline 200mg stat, followed by 100mg od for 5-7 days as per BNF treatment for susceptible infection/ micro guide skin infection, if the patient is allergic to penicillins).
 - ***If MRSA is suspected, go straight to step 4.***
- 4 Review with swab results in 48 hrs and if the patient is on antibiotics, modify antibiotic therapy accordingly.
 - For MRSA, or if the patient is allergic to penicillin, give Vancomycin 1 g i.v stat, then a prescribed dose after each HD session.
 - If allergic to Vancomycin, discuss with Renal SpR or Consultant.
- 5 Duration of treatment should be for **at least 2 weeks**.
- 6 For MRSA exit site infection, mupirocin must be applied on the exit site for the duration of the eradication treatment.

NB If the exit site score remains 4 or greater in spite of antibiotics, discuss with HD consultants about:

- Whether the line should be removed, or
- Whether a second course of antibiotics should be given.

Staphylococcus aureus (*S. aureus*) is the leading cause of catheter exit site infection and bacteraemia in haemodialysis patients. Empirical therapy should therefore be for *S. aureus* as it accounts for between 40-80% of all ESIs.

Bacteraemia and tunnel tract infections are the leading causes of catheter loss. Infections with *S. aureus*, MRSA and pseudomonas are notoriously difficult to clear and might need prolonged courses of treatment if the line is to be left in place.

Guidelines for treatment of HD catheter tunnel infections

A tunnel infection is deemed to be present if the catheter tunnel is inflamed, +/- a purulent exudate.

- 1 **The catheter should be removed** , unless otherwise instructed by the renal consultant and the tip should be sent for culture. A blood culture, FBC, and CRP should be taken and an exit site swab should also be sent for MC&S.
- 2 Start empirical antibiotic therapy as follows:
 - Give Vancomycin 1 g i.v stat and Gentamicin (80 mg if weight < 60 kg, 120 mg if weight 60-80 kg and 160 mg if weight >90 kg)
 - Review culture results.
 - If MSSA is confirmed, switch to Flucloxacillin 500 mg qds (preferably i.v) and **IF** the line is still *in situ*, consider adding oral Fusidic acid 500 mg tds (or Rifampicin 600 mg od).
 - If MRSA is confirmed, or if the patient is allergic to penicillins, give Vancomycin 1 g i.v stat and **IF** the line is still *in situ*, consider adding oral Fusidic acid 500 mg tds (or Rifampicin 600 mg od).
 - If a gram negative infection is confirmed, discuss subsequent antibiotic choice with microbiologists.

Note – Vancomycin has poor tissue and bio-film penetrance, so it should not be used as monotherapy in tunnel infections if the line is left in-situ.

- 4 The course of treatment should last for **at least 2 weeks**.

NB If it is not possible to remove the catheter, the patient should be admitted and started on intravenous antibiotics. Note that it is extremely unlikely that tunnel infections will resolve without removal of the catheter. Discuss with HD or duty consultant.

Catheter Related Bacteraemia - see line sepsis protocol.

References

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Appendix: Haemodialysis Catheter Exit Site Evaluation Tool

Catheter related infection is an important cause of haemodialysis related morbidity and mortality.

This document aims to provide a systematic method of exit site evaluation and thus will hopefully help in the identification of possible exit site infections. It should be used in conjunction with the protocol on management of exit site infection.

The intention is that any member of the dialysis team should be able to look at any exit site at each haemodialysis session and make an assessment of the exit site using straight forward objective clinical signs.

Evaluation Tool	Score	
	Yes	No
Redness	1	0
Swelling	1	0
Pain/Tenderness	1	0
Exudate	3	0
Crust	2	0
Pus	4	0

Yes = 1 - 4 No = 0

Exit Site Score System: Total Score

0-1 Exit site unlikely to be infected

2-3 Exit site may be inflamed and at risk of infection

≥4 Exit site is likely to be infected

Management of exit site according to Exit Site Score

0-1

Continue current exit site care plan

2-3

Continue to observe. Consider review of current exit site care plan

≥4

Swab exit site and send sample to microbiology for MC&S. Ask member of medical team to review. Refer to management of exit site infections protocol.

Full version control record

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Version History

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