1. Introduction

Catheter related blood stream infection (CR-BSI) is a common and serious complication in patients with indwelling haemodialysis (HD) catheters. CR-BSI may arise directly as a result of bacterial ingress along the catheter tract from a catheter exit site or tunnel infection. K-DOQI (1) has suggested definitions for exit site and tunnel infections and for the purposes of this guideline a practical definition of colonisation is given:-

- Exit Site Colonisation

Positive cultures from exit site swab in the absence of any clinical signs of infection (redness, discomfort, discharge); swab will often have been taken as screening for MRSA/MSSA carriage.

- Exit-site infection

Inflammation confined to the area surrounding the catheter exit site, not extending superiorly beyond the cuff if the catheter is tunnelled, with exudate culture confirmed to be positive.

- Tunnel infection

The catheter tunnel superior to the cuff is inflamed, painful, and may have drainage through the exit site that is culture positive.

The EPIC3 guidelines (see supporting documents) offer detailed advice on catheter care and preventing central venous catheter exit site infections but not on treatment strategies.

2. Scope

All patients undergoing dialysis through a temporary ('vascaths') or semi-permanent ('permcaths') haemodialysis catheter.

Clinical guidelines are 'guidance' only. The interpretation and application of clinical guidelines will remain the responsibility of the individual practitioner. If in doubt consult a senior colleague or expert

3. Recommendations, Standards and Procedural Statements

3.1 Diagnosis

The HD catheter exit site must be inspected at each dialysis session either through the transparent dressing or where an occlusive dressing has been used by removal of dressing. (A transparent dressing should always be used except where patient allergies or exit site exudates indicate otherwise). Where there is evidence of inflammation or exudate, the exit should be swabbed then cleaned with 2% chlorhexidine in 70% alcohol and treated as below.

This guideline should not be used for patients who are systemically unwell with fever, rigors, vomiting/diarrhoea, other systemic symptoms or raised inflammatory markers suggesting bacteraemia. Such patients should be treated according to the guideline 'Management of Haemodialysis Catheter Related Blood Stream Infection'

3.2 Treatment of exit site colonisation

Exit site colonisation with MSSA or MRSA can usually be treated with topical mupirocin applied to the exit site at each dialysis for 5 consecutive HD sessions. However, swabs growing normal skins organisms such as coagulase negative staphylococci or corynebacterium without evidence of local sepsis do not require any treatment.

3.3 Treatment of exit site infection

Exit site infection can usually be treated without catheter removal (1). Where there is clinical evidence of exit site infection initial empirical treatment should be with flucloxacillin po 500mg qds for 5days or doxycycline po 200mg od for 5days if penicillin allergic.

Further treatment will depend on the results of swabs which must be chased up at next HD session. Treatment of certain organisms will require additional antibiotic therapy according to the table but if in doubt seek microbiological advice.

ORGANISM	TREATMENT REGIME	COMMENTS
S. aureus(MSSA)	Flucloxacillin PO 500mg qds for 5days or Doxycycline 200mg OD for 5days if penicillin allergic	
MRSA	Doxycycline 200mg OD for 5days	Consider catheter removal
Pseudomonas/ Acinetobacter	Ciprofloxacin 500mg bd for 5days	

The catheter must be carefully inspected over the next few dialysis sessions to ensure infection is resolving.

Where MRSA is grown, catheter removal should be considered urgently by a senior clinician due to the risk of MRSA bacteraemia. This decision may be influenced by other access options.

3.4 Treatment of tunnel infection

Tunnel infections (pain, swelling and redness proximal to the cuff +/- evidence of exit site infection) are generally difficult to treat without catheter removal and are associated with a high risk of bacteraemia. All patients with clinical evidence of tunnel infection should have local swabs, blood cultures and c-reactive protein checked and most patients will require admission. Systemic antibiotics should be commenced empirically with flucloxacillin 1g qds IV initially (or vancomycin per HD CR-BSI protocol if penicillin allergic).

Further treatment should be adjusted according to culture results, if necessary in consultation with microbiology. If clinical improvement does not occur within 48hrs, the line should be removed. If it is judged that line must be retained for vascular access this must be discussed with the responsible consultant nephrologist.

4. Education and Training

All staff who are responsible for haemodialysis patients should be familiar with this guideline

5. Monitoring and Audit Criteria

Key Performance Indicator	Method of Assessment	Frequency	Lead
Adherence to policy	Root cause analyses of bacteraemia/ad hoc audits	On going	Nephrology IP committee

6. Legal Liability Guideline Statement

See section 6.4 of the UHL Policy for Policies for details of the Trust Legal Liability statement for Guidance documents

7. Supporting Documents and Key References

- NKF K-DOQI Clinical practice guidelines for vascular access. Am J Kid Dis 2006:48;s176 - s247
- epic3: National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England. Loveday H et al. Journal of Hospital Infection 86S1 (2014) S1–S70

8. Key Words

Haemodialysis, exit site, bacteraemia

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This table is used to track the development and approval and dissemination of the document and any changes made on revised / reviewed versions

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