

1. Introduction

Catheter related blood stream infection (CR-BSI) is a common and serious complication in patients with indwelling haemodialysis (HD) catheters. In the UHL renal network, the infection rate in patients with tunneled, cuffed HD catheters was approximately 5/1000 patient catheter days (internal audit May 2006) but has fallen to ~1/1000 catheter days with use of antibiotic locks (Taurohep) and increased attention to catheter care. CR-BSI has been associated with nasal/skin carriage of staphylococci (**both fully sensitive S. aureus [MSSA] and MRSA**) and local eradication therapy has been shown to reduce the rate of CR-BSI (1).

Because of the numbers of patients with CR-BSI, the nephrology department in conjunction with microbiologists and infection control team have a policy of empirical eradication of nasal and skin carriage for all patients who are undergoing HD catheter insertion. UHL has a policy of continuous eradication treatment for all inpatients with HD catheters that are considered at high risk of MRSA bacteraemia.

Patients with longer term catheters on outpatient haemodialysis must be monitored monthly for MSSA/MRSA skin/nasal carriage to identify patients needing further treatment. Following root cause analyses of MRSA/MSSA bacteraemia in 2011, it was agreed that patients with long term HD catheters who had had repeated exit site infections or CR-BSI should have impregnated dressings applied to the catheter exit site.

2. Scope

This guideline is for medical and nursing staff responsible for the care of patients with haemodialysis catheters. Clinical guidelines are 'guidelines' 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 Target population

3.1.1. All patients undergoing new insertion or replacement of temporary ('vascaths') or semi-permanent ('permcaths') haemodialysis catheter. Catheters replaced over guide wires should be treated as new catheters.

3.1.2 All prevalent outpatient HD patients who have semi-permanent or temporary haemodialysis catheters

3.2 Empirical eradication of staphylococcal nasal and skin carriage

All patients undergoing HD catheter insertions must have nasal and perineal swabs taken pre-procedure. These are sent to bacteriology with request for 'HAEMODIALYSIS CATHETER SCREEN' (N.B. DO NOT REQUEST 'MRSA SCREEN' AS THIS WILL FAIL TO DETECT FULLY SENSITIVE STAPH. AUREUS).

At time of catheter insertion, all patients must be prescribed for five days -

- Topical mupirocin to each nostril three times a day
- Stellisept(or other recommended antiseptic soap) daily wash
- Wash hair twice during this period

The eradication therapy must be prescribed on the drug chart if inpatient or script given to patient if outpatient (**with clear instructions of what to do**).

If patient remains as inpatient after the 5 days then stellisept and mupirocin must continue whilst line is in situ

It is not necessary to wait for pre-treatment swab results – all patients are treated empirically.

3.3 Follow-up

3.3.1 All prevalent HD patients with catheters for dialysis must have nasal, perineal and haemodialysis catheter exit site swabs taken as part of 'monthly bloods & swabs'. These are sent to bacteriology with request for 'HAEMODIALYSIS CATHETER SCREEN' (N.B. DO NOT REQUEST 'MRSA SCREEN' AS THIS WILL FAIL TO DETECT FULLY SENSITIVE STAPH. AUREUS).

3.3.2 Swabs should also be taken from any open wounds, sputum sent if patient has a productive cough and a urine sample if the patient has a urinary catheter.

3.3.3 All patients with positive swabs for Staph. aureus/MRSA will be treated with mupirocin and stellisept as above.

3.3.4 Patients identified with MRSA carriage should be risk assessed for the need for isolation but will generally not require isolation if attending for outpatient haemodialysis unless they have an open wound or weeping skin lesions (see appendix 1).

3.3.5 Patients with swabs from the haemodialysis catheter exit site positive for Staph. aureus/MRSA must have treatment with mupirocin to the exit site when they attend for dialysis applied for 5 consecutive dialysis sessions. However, in addition, the exit site should be carefully inspected for signs of clinical infection (erythema, swelling, purulent discharge) and to exclude any evidence of tunnel infection. Where there is evidence of local infection, treatment should be given in line with the guideline for treating haemodialysis catheter exit

site infections (see separate guideline). The catheter should be carefully inspected over the next few dialyses to ensure infection is resolving.

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

3.3.7 Appendix 2 provides a care plan for documenting swabs for patients but many areas will already have a system in place and, as long as there is a document trail, other systems are acceptable.

3.4 Use of impregnated dressings (Biopatch)

There is increasing evidence that the use of impregnated dressings applied to the exit site of intravenous catheters may reduce the incidence of exit site infections and CR-BSI in temporary lines (3). As a result chlorhexidine impregnated discs (Biopatch) will be used for the duration of all temporary lines (i.e. vascaths). These dressings should be replaced weekly.

4. Education and Training

Audits have shown that compliance with screening and eradication is good but correct use of Biopatch dressing varies. The responsibility for ensuring staff are trained and updated with these procedures lies with medical management, ward sisters and haemodialysis matrons

5. Monitoring and Audit Criteria

Key Performance Indicator	Method of Assessment	Frequency	Lead
Compliance with monthly screening for MRSA/MSSA in patients with HD catheters	% screened	annual	HD matrons/IP link nurses

6. Key Words

haemodialysis, central venous catheter, septicaemia, staph aureus, MRSA, mupirocin

7. References

- Am J Kid Dis 1996;27:687-694
- UHL MRSA policy DMS no.53363
- Timsit JF, Schwebel C, Bouadma L, et al. Chlorhexidine-impregnated sponges etc JAMA 2009;301:1231-1241

Appendix 1

University Hospitals of Leicester Criteria for Risk Assessment of Patients with MRSA on the HDU

This list is not exhaustive and there must be a documented agreement with the Infection Prevention Team before patients with MRSA are treated without isolation on the Haemodialysis Unit,

Isolation must be carried out for patients with any of the following:-

- 1) Exfoliating skin disease e.g. eczema, dermatitis, psoriasis or other skin conditions
- 2) Exudating skin lesions e.g. blisters or boils, pressure sores leg ulcers wounds
- 3) Clinical infection with MRSA e.g. MRSA skin infection or chest infection
Diarrhoea caused by MRSA (Rare)

The risk assessment should be recorded on proforma (see below), discussed and agreed with Infection Control nurse and must be repeated in the event of a change in the condition of the patient.

Management of low risk patients with MRSA in haemodialysis units

1. All health care workers must follow STANDARD PRECAUTIONS (previously known as universal precautions) in dealing with low risk MRSA positive patients
2. Disposable gloves and plastic aprons must be worn for all clinical contact with patients
3. Hands should be washed with soap and water after gloves removed and then disinfected with alcohol gel
4. Wound dressings should not be removed or wounds redressed on the haemodialysis unit.
5. After dialysis the HD machine and the treatment chair/bed and anything that has come into contact with the patient must be cleaned with Chlorclean
6. A further risk assessment of the patient must be undertaken on a monthly basis or sooner if the condition of the patient changes

Outpatient Haemodialysis MRSA Risk Assessment Proforma

Haemodialysis site:	Tel. no.:	
Patient name:	Date of birth:	
Hospital No:	Date of risk assessment:	
RISK FACTORS	YES	NO
1. Exfoliating skin disease		
2. Exuding skin lesions		
3. Clinical infection with MRSA e.g. bacteraemia, wound infection, MRSA chest infection		
Suitable for dialysis without isolation		
Risk assessment by: _____ (print name)		Date:
Signature: _____		
Position:		
Name of Infection prevention nurse consulted: _____		
Advice from Infection prevention Nurse:		
Review date:(1 month after assessment):		
When completed please send copy of form to infection prevention nurse and file in nursing HD notes		

Appendix 2
MONTHLY HAEMODIALYSIS
CATHETER SCREEN FOR MRSA/MSSA

Address label

Problem:

Patient is receiving outpatient dialysis via a haemodialysis catheter and requires screening monthly for MRSA/MSSA carriage

Goal:

To reduce the risk of an infection and to promote early intervention as required.

Intervention:

1. Obtain patients consent: explain the importance / reason to swab supported with the UHL information leaflet and letter. Allow time for you patient to ask questions.
2. Screens to be taken with clear-blue swabs moistened with sterile normal saline from P/C exit site nose (both nostrils are swabbed), perineum and all risk factors (wounds, breaks in skin, line sites urine if catheterised and sputum if patient has a productive cough).
3. Patients whom have a wound dressed in the community, please provide with a swab to take home to be taken at the time of the next dressing change and to bring back with them when returning for dialysis.
4. Requests to be made electronically via ICM through microbiology, requesting a dialysis catheter screen. (DCS) – this will ensure both MRSA and MSSA are cultured
5. Document all results electronically on the m drive. Positive results to be documented in patients nursing folder on the DCS care plan with instruction for appropriate intervention and inform your patient.
6. Follow up screen to be requested in the clinical investigation diary 48 hours post treatment.

Date and time	Area swabbed	Signature	Result	Treatment Given/date	Post Tx screen Done/date/signature

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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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4Jun 2009	4	G Warwick	Clarification of screening procedure – nose, perineum and exit site and treatment of positive exit site swabs; emphasis on what to do if MRSA at exit site
13Feb 2011	5	G Warwick, Jo Bayes, Tracey Cox, Is Jones	Screen patients at line insertion; care plan inserted as appendix
19Dec 2011	6	G Warwick	Use of impregnated dressings for patients with recurrent infections
1Feb 2013	7	G Warwick	Routine use of Biopatch dressings added
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23.08.19	9	S Glover/ R Baines	Routine use of Biopatch for temporary catheters only
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