Academic Department of Critical Care
Queen Alexandra Hospital Portsmouth

Portsmouth Hospitals NHS
NHS Trust

Dialysis Catheters in Critical Care

Aim To reduce complications of dialysis catheter use by providing clear guidance on standards of care
Scope All patients in Critical Care with a dialysis catheter, whether inserted before or during admission to Critical Care

Timing of dialysis catheter change

- No indication for 'routine' catheter changes - it should be a clinical decision
- Any suggestion of infection - line should be removed regardless of duration
- The need for a line should be reviewed and documented daily

Insertion

- Preferred insertion sites: internal jugular &femoral (avoid subclavian if possible)
- Length of catheter: RIJ/SC = 15cm, LIJ/LSC = 15-20cm, femoral = minimum 20cm
- Skin preparation: 2% chlorhexidine gluconate in 70% isopropyl alcohol skin preparation and allow to dry (if sensitivity use povidone-iodine)
- Personal protective equipment should be used
- Correct hand hygiene and full aseptic technique (gown, gloves and drapes)
- Use sterile transparent semi permeable dressing so that point of insertion is visible
- Safe disposal of sharps
- Ensure correct documentation on CIS post procedure

Daily care check list

- Daily active observation of insertion site
- Ensure 2 sutures in place
- Maintain clean semi-permeable dressing (can stay for up to 7 days if clean)
- Ensure TauroLock has been instilled into each lumen if line is not being used
- Use dialysis line only for renal replacement therapy
- Ensure correct documentation on CIS

Use of Taurolock™

- If catheter is not to be used for at least 3 hours then Taurolock™ catheter lock solution should be used
- At end of treatment fully flush line with 0.9% sodium chloride
- Instill desired volume of neat Taurolock™ into each lumen (volume is printed on each arm)
- Ensure Taurolock™ prescribed and signed on CIS

Version: 1.0 | Date: 06 Mar 15 | Revision Due: 06 Mar 17 | Authors: Dr Sara Blakeley

University of Portsmouth

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1. INTRODUCTION

Patients on the ICU are at risk of hospital acquired infections given the nature of a critical illness and as they receive invasive treatment and monitoring. Hospital acquired infections (HAI) are a significant problem not just in terms of mortality and morbidity but also financial costs. Catheter related blood stream infection (CRBSI) is one such HAI. The catheter insertion site itself is the most direct portal of entry micro-organisms. These are usually gram positive skin organisms however in critically ill patient there is a greater range of potential infecting organisms to consider. Catheter colonization is when micro organisms form a biofilm over the catheter surface and this can occur as early as 24 hours post insertion of the line. Antibiotics will not clear catheter colonization. It is important to distinguish between catheter colonization and catheter related blood stream infection. For CRBSIs the same organism that is identified from the line is also identified from peripheral blood cultures when taken simultaneously.

CRBSIs can be reduced by good insertion technique, good care of the catheter and timely removal. This document outlines the components of the dialysis catheter care bundle and also the use of the catheter lock solution TauroLock™. This bundle is very similar to the central venous catheter care bundle.

Use of TauroLock™

When a dialysis line is not in use, there is the potential for thrombosis to occur within the line. Thrombosis leads to poor flows, inadequate filtration and ultimately shortened filter survival time. There are a number of solutions that are available to instil into each lumen of the dialysis line to prevent clotting. TauroLock™ is a catheter lock solution composed of Cyclo-Taurolidine and 4% citrate. Taurolodine is a derivative of aminosulphonamide-taurinamide, which has antimicrobial activity against a broad range of bacterial and fungi, including MRSA and Pseudomonas aeruginosa. The citrate component acts as an anticoagulant. Citrate chelates calcium which is needed for coagulation. TauroLock™ has been shown to be safe, with no reported side-effects following inadvertent injection of the solution. It is not associated with antibiotic resistance.

2. PURPOSE

This document has been developed to guide all staff in the care of dialysis catheters (vascaths) within the Department of Critical Care (DCCQ). The aim of this document is to help reduce potential complications associated with dialysis catheters, such as infection.

3. SCOPE

This guideline applies to all critical care patients admitted to DCCQ with a dialysis catheter in situ or those that have a dialysis catheter inserted during their admission

In the event of an infection outbreak, flu pandemic or major incident, the Trust recognises that it may not be possible to adhere to all aspects of this document. In such circumstances, staff should take advice from their manager and all possible action must be taken to maintain ongoing patient and staff safety. This guideline is subject to professional judgement and accountability.

4. DEFINITIONS

Dialysis catheter (also called a vascath): This is a wide bore double lumen catheter commonly used for renal replacement therapy.
IJ – internal jugular vein
SC – subclavian vein

5. DUTIES AND RESPONSIBILITIES

- This policy is the responsibility of the author and the guidelines group.
- The decision to implement this guideline is at the discretion of the on-call critical care consultant.
- Implementation of this guideline is the joint responsibility of appropriate critical care medical/ nursing staff.
- This guideline is subject to professional judgment and accountability.
- Subsequent medical management may be influenced by predicted neurological outcome (see appendix 1)

6. PROCESS

A. Decision for insertion/change of dialysis catheter

There is no indication for routine catheter changes
• A clinical decision should be taken when to change the catheter
• If there is any suggestion of a catheter related infection (either systemic or local) then the catheter should be removed ***regardless*** of how long it has been in place
• It should be decided daily as to whether the catheter should stay in situ, be changed or removed

B. Insertion of the dialysis catheter

Component	Comments
Choice of insertion site *	• The catheter should be inserted in the internal jugular or femoral vein with the subclavian route being avoided where possible due to the risk of subclavian stenosis
Choice of catheter	• Right IJ/SC: 15cm straight catheter • Left IJ/SC: 15-20cm straight catheter • Femoral: Minimum 20cm straight
Correct skin preparation*	• 2% chlorhexidine gluconate in 70% isopropyl alcohol skin preparation and allow to dry (if sensitivity use povidone-iodine)
Personal protective equipment*	• Use eye/face protection if indicated
Correct hand hygiene*	• Decontaminate hands before and after each patient contact • Use correct hand hygiene procedure
Use aseptic technique*	• Sterile gown/gloves and drapes at all times
Use appropriate dressing*	• Post procedure: cover with sterile transparent semi-permeable dressing so that point of insertion is visible
Safe disposal of sharps*	• A sharps container should be available at the point of use • Do not disassemble needle and syringe • Do not pass sharps from hand to hand

Details of insertion should be documented in the notes*	• Entry on CIS should be under *'Invasive Procedures - vascath'* • CXR findings should be documented with reference to position of the tip of the line, the presence of a pneumothorax and any other significant findings (jugular/subclavian lines)

** Indicates elements of DOH Saving Lives High Impact Intervention No 3 (Renal dialysis catheter care bundle)*

C. Daily dialysis catheter care checks

Component	Comments
Observe the insertion site appearance daily*	• *Active* observation of the insertion site & document on CIS • Any abnormality of the insertion site should be reported to the doctor caring for the patient
Ensure line is sutured in place	• x 2 sutures
Maintain clean dressing*	• Change dressing when damp, loose or soiled • A semi-permeable dressing may remain in-situ for 7 days if clean and intact
Ensure TauroLock™ has been instilled into each lumen	• See section E
The dialysis catheter should *only* be used for renal replacement therapy	• In an emergency (e.g. cardiac arrest) the dialysis catheter can be used on the advice of the senior doctor present

** Indicates elements of DOH Saving Lives High Impact Intervention No 3 (Renal dialysis catheter care bundle)*

D. Use of the dialysis catheter

1. Assemble necessary equipment onto bedside locker cleaned with recommended multi-surface wipe
   - Sterile field
   - 2% chlorhexidine gluconate in 70% isopropyl alcohol spray
   - sterile glove pack (containing gloves, yellow/white bag and green sterile field), small dressing pack

2. Put on PPE and wash hands

3. Empty necessary equipment on to sterile field
   - 2 x 10mls syringes
   - 20mls 0.9% sodium chloride into galipot
   - Sterile gloves packet

4. Place yellow/white bag under dialysis catheter ports and spray both dialysis catheter ports with 2% chlorhexidine gluconate in 70% isopropyl alcohol.
   - Allow to dry for 30 seconds

5. Put on sterile gloves

6. Aspirate a **minimum** of 5mls of blood from **each** lumen to ensure free from blood clots (use gauze square to check this) then flush each lumen with 20mls 0.9% sodium chloride injection
   - This will also remove any TauroLock that was instilled into the catheter lumens
   - If line is blocked, inform medical staff

7. Continue with connection to Prismaflex

E. Use of TauroLock

TauroLock™ should be instilled into any dialysis line that will not, or potentially will not be used for at *least 3 hours*

1. The catheter should be handled in an aseptic manner as outlined above

2. At the end of the treatment or after insertion of the line, make sure that *each* lumen of the dialysis line is completely flushed with 0.9% sodium chloride.
   - There should be no visible blood left in either lumen.

3. Draw up 5mls of TauroLock™ in a 5ml syringe, it does not need to be diluted
   - It should be prescribed on CIS

4. Instil the appropriate volume of TauroLock™ into *each* lumen of the dialysis line.
   - The volume is printed on each arm of the dialysis catheter

5. When instilling the volume into each lumen, clamp the line *as* you are flushing and therefore while a positive pressure is still being applied.
   - This prevents traces of blood refluxing back up into the tip of the catheter

6. Sign that the lock has been given and complete the CIS documentation

7. TRAINING REQUIREMENTS

Training will be through the Renal group and the Teaching Team

8. MONITORING COMPLIANCE WITH, AND THE EFFECTIVENESS OF, PROCEDURAL DOCUMENTS

Minimum requirement to be monitored	Lead	Tool	Frequency of Report of Compliance	Reporting arrangements	Lead(s) for acting on Recommendations
Adherence with sections B and C of guideline	Sr Clare Rochester	**Data collected from CIS**	Rolling audit (monthly data analysis)	Policy audit report to: • Department of Critical Care Governance Group	Dr Sara Blakeley

This document will be monitored to ensure it is effective and to assurance compliance.

The effectiveness in practice of all procedural documents should be routinely monitored (audited) to ensure the document objectives are being achieved. The process for how the monitoring will be performed should be included in the procedural document, using the template above.

The details of the monitoring to be considered include:

- The aspects of the procedural document to be monitored: identify standards or key performance indicators (KPIs);
- The lead for ensuring the audit is undertaken
- The tool to be used for monitoring e.g. spot checks, observation audit, data collection;
- Frequency of the monitoring e.g. quarterly, annually;
- The reporting arrangements i.e. the committee or group who will be responsible for receiving the results and taking action as required. In most circumstances this will be the committee which ratified the document. The template for the policy audit report can be found on the Trust Intranet Trust Intranet -> Policies -> Policy Documentation
- The lead(s) for acting on any recommendations necessary.

9. REFERENCES AND ASSOCIATED DOCUMENTATION

Documents used when preparing this care bundle are:

1. High impact intervention Number 3 (for dialysis catheters) – Department of Health
2. High impact intervention Number 1 (for central venous catheters) – Department of Health
3. Clinical guideline for management of central venous catheters – Department of Critical Care Portsmouth (Sr Louise Hatch and SN Fatma Neilson, DCCQ, 2006 guideline)

Copies of studies using TauroLock™ can be found on the website:
http://www.taurolock.de/index.php?id=1&lang=2 (last accessed 30/10/2014)

Appendix A

Checklist for the Review and Ratification of Procedural Documents and Consultation and Proposed Implementation Plan

To be completed by the author of the document and attached when the document is submitted for ratification: a blank template can be found on the Trust Intranet. Home page -> Policies -> Templates

CHECKLIST FOR REVIEW AND RATIFICATION			
TITLE OF DOCUMENT BEING REVIEWED:		YES/NO N/A	COMMENTS
1	**Title**		
	Is the title clear and unambiguous?	Yes	
	Will it enable easy searching/access/retrieval??	Yes	
	Is it clear whether the document is a policy, guideline, procedure, protocol or ICP?	Yes	
2	**Introduction**		
	Are reasons for the development of the document clearly stated?	Yes	
3	**Content**		
	Is there a standard front cover?	Yes	
	Is the document in the correct format?	Yes	
	Is the purpose of the document clear?	Yes	
	Is the scope clearly stated?	Yes	
	Does the scope include the paragraph relating to ability to comply, in the event of a infection outbreak, flu pandemic or any major incident?	Yes	
	Are the definitions clearly explained?	Yes	
	Are the roles and responsibilities clearly explained?	Yes	
	Does it fulfill the requirements of the relevant Risk Management Standard? (see attached compliance statement)		
	Is it written in clear, unambiguous language?	Yes	
4	**Evidence Base**		
	Is the type of evidence to support the document explicitly identified?	Yes	
	Are key references cited?	Yes	
	Are the references cited in full?	Yes	
	Are associated documents referenced?	Yes	
5	**Approval Route**		
	Does the document identify which committee/group will approve it?	Yes	DCCQ Clinical Governance Group
6	**Process to Monitor Compliance and Effectiveness**		
	Are there measurable standards or KPIs to support the monitoring of compliance with the effectiveness of the document?	Yes	
7	**Review Date**		
	Is the review date identified?	Yes	
6	**Dissemination and Implementation**		
	Is a completed proposed implementation plan attached?	Yes	
7	**Equality and Diversity**		
	Is a completed Equality Impact Assessment attached?	Yes	

Appendix A
continued

CONSULTATION AND PROPOSED IMPLEMENTATION PLAN	
Date to ratification committee	
Groups /committees / individuals involved in the development and consultation process	DCCQ Guidelines Group Critical Care Governance Group Multidisciplinary staff working in DCCQ
Is training required to support implementation?	Yes
If yes, outline plan to deliver training	Multidisciplinary teaching via unit based teaching teams, regular teaching sessions on Fridays and bedside teaching from experienced staff
Outline any additional activities to support implementation	Promotion of introduction of guideline via unit based webpage and verbally through presentation at teaching sessions

Individual Approval

If, as the author, you are happy that the document complies with Trust policy, please sign below and send the document, with this paper, the Equality Impact Assessment and NHSLA checklist (if required) to the chair of the committee/group where it will be ratified. To aid distribution all documentation should be sent electronically wherever possible.

Name	**Dr Sara Blakeley**	**Date**	23 Feb 15
Signature	*signed electronically*		

Committee / Group Approval

If the committee/group is happy to ratify this document, would the chair please sign below and send the policy together with this document, the Equality Impact Assessment, and NHSLA checklist (if required) and the relevant section of the minutes to the Trust Policies Officer. To aid distribution all documentation should be sent electronically wherever possible.

Name	**Dr NT Tarmey**	**Date**	06 Mar 15
Signature	*signed electronically*		

If answers to any of the above questions is ‘no’, then please do not send it for ratification.

Appendix B

Equality Impact Assessment

To be completed by the author of the document and attached when the document is submitted for ratification: a blank template can be found on the Trust Intranet. Home page -> Policies -> Templates

Title of document for assessment	Dialysis Catheters in Critical Care
Date of assessment	27 Feb 15
Job title of person responsible for assessment	Dr N Tarmey
Division/Service	DCCQ / CHAT CSC

	Yes/No	Comments
Does the document affect one group less or more favorably than another on the basis of:		
Race	No	
Gender (including transgender)	No	
Religion or belief	No	
Sexual orientation, including lesbian, gay and bisexual people	No	
Age (for HR policies only)	No	
Disability – learning disabilities, physical disabilities, sensory impairment and mental health problems	No	
Does this document affect an individual's human rights?	No	
If you have identified potential discrimination, are the exceptions valid, legal and/or justified?		

If the answers to any of the above questions is 'yes' you will need to complete a full Equality Impact Assessment (available from the Equality and Diversity website) or amend the policy such that only an disadvantage than can be justified is included. If you require any general advice please contact staff in the Equality and Diversity Department on 02392 288511