

Saving Lives: reducing infection, delivering clean and safe care

High Impact Intervention No 3

Renal dialysis catheter care bundle



Aim

To reduce the incidence of renal dialysis catheter-related bloodstream infection (DCR-BSI)

Context

The Health Act 2006 Code of Practice¹ states that NHS organisations must audit key policies and procedures for infection prevention. This high impact intervention helps trusts achieve this aim by providing a focus on elements of the care process and a method for measuring the implementation of policies and procedures.

The use of dialysis catheters is the most common factor contributing to bacteraemia in dialysis patients.²

In the 2005 Renal Association/Renal Registry survey of 62 renal dialysis units in the UK, 29% of haemodialysis patients received dialysis via an intravascular catheter.³ In this patient group 1,576 episodes of *Staphylococcus aureus* bacteraemia were reported, of which 462 episodes (29%) were MRSA. Furthermore, bacteraemias related to dialysis catheters accounted for 29% of dialysis-related admissions and utilised an estimated 100,000 bed days per annum.

In 2000, the National Audit Office estimated the additional cost of a bloodstream infection to be £6,209 per patient demonstrating the financial burden placed on renal services in the UK by healthcare associated infections (HCAI).⁴

The Department of Health (DH) commissioned the EPIC team at Thames Valley University to produce a set of guidelines for the prevention of HCAI, in particular catheter-related bloodstream infection (CR-BSI).⁵ These guidelines form the basis of this high impact intervention. The Renal Association has produced guidelines for haemodialysis, including recommendations for vascular access.⁶

The DH document *Winning ways*⁷ makes recommendations for the management of central venous lines⁷ and the Infection Control Nurses Association (ICNA) audit tool has a section on central venous catheter care,⁸ elements of which are relevant to the management of dialysis catheters. The American Centers for Disease Control have also produced extensive guidelines⁹ for the prevention of infections related to centrally placed catheters.

The use of antimicrobial agents in the locking solution may also help prevent catheter-related infections. An antimicrobial agent such as gentamicin is appropriate for preventing MRSA infection. The choice of antimicrobials should be based on local microbiological surveillance data.^{10,11}

All patients on renal dialysis should be screened for MRSA colonisation and then started on a decolonisation regimen prior to line insertion if found to be positive.¹²

Why use the care bundle?

This care bundle is based on EPIC guidelines, expert advice and other national infection prevention and control guidance. It should support implementation of local and national policy. The purpose is to act as a way of improving and measuring the implementation of key elements of care.

The risk of infection reduces when all elements within the clinical process are performed every time and for every patient. The risk of infection increases when one or more elements of a procedure are excluded or not performed.

Elements of the care process

There are two sets of actions outlined below as good practice; these are concerned with:

- a insertion
- b ongoing care.

Insertion actions

Dialysis catheter type

- Tunnelled dual lumen catheter if dialysis treatment is expected to continue for greater than 21 days.

Insertion site

- Internal jugular is the preferred site.⁶
- Femoral vein may be considered.
- Subclavian vein stenosis may impair a future shunt.

Skin preparation

- Preferably use 2% chlorhexidine gluconate in 70% isopropyl alcohol and allow to dry.
- If patient has a sensitivity use a single patient use povidone-iodine application.

Personal protective equipment

- Eye/face protection is indicated if there is a risk of splashing with blood or body fluids.

Hand hygiene

- Decontaminate hands before and after each patient contact.
- Use correct hand hygiene procedure.

Aseptic technique

- Gown, gloves and drapes as indicated should be used for the insertion of invasive devices.

Dressing

- Use a sterile, semi-permeable, transparent dressing to allow observation of insertion site.

Safe disposal of sharps

- Sharps container should be available at point of use and should not be overfilled; do not disassemble needle and syringe; do not pass sharps from hand to hand.

Documentation

- Date of insertion should be recorded in notes.

Ongoing care actions

Hand hygiene

- Decontaminate hands before and after each patient contact.
- Use correct hand hygiene procedure.

Insertion site inspection

- Observe the insertion site at the beginning of each dialysis session.

Dressing

- An intact, dry, adherent transparent dressing is present.

Catheter access

- Use aseptic technique and swab ports or hub with 2% chlorhexidine gluconate in 70% isopropyl alcohol prior to accessing the line.

Antimicrobial lock

- Use antimicrobial lock if indicated by local surveillance data.

No routine catheter replacement

- Malfunctioning catheters should not be routinely replaced by rewiring.

Using the bundle to ensure all elements of care are performed

Checking compliance with the elements in the care process will show the elements which were or were not performed. The tools on the CD will help you to:

- 1 identify when all elements have been performed
- 2 see where individual elements of care have not been performed
- 3 enable you to focus your improvement effort on those elements which are not being consistently performed

Using the compliance tool

- 1 Each time a care element is performed, insert a tick in the relevant column. If the action is not performed leave it blank.
- 2 Do this for each action, ensuring you tick it only when an element of care is performed correctly.
- 3 Calculate the totals and compliance levels by totalling the columns and using the tools provided (on the CD or at www.clean-safe-care.nhs.uk).
- 4 Your goal is to perform every element of care every time it is needed. The "All elements performed" column should be ticked when every care element is given correctly. This should total to 100% compliance when all care elements have been given correctly on every occasion.
- 5 Where elements have not been performed overall compliance will be less than 100%. This provides immediate feedback for users of the tool on those elements missed, and actions can then be taken to improve on compliance levels.
- 6 The percentage compliance figures for individual care elements show you where you need to focus effort to improve overall compliance.
- 7 The number of times when all elements are performed should be the same as the number of observations you perform. For example if you monitor the care process 10 times, then there should be 10 occasions when all elements were performed.

When the calculation is completed, the calculator tools on the CD (or at www.clean-safe-care.nhs.uk) will automatically show compliance graphs and run-charts for each element of care and for overall compliance with each high impact intervention. This will show you visually where to focus your improvement efforts to achieve full compliance.

Example

Care elements Observation	Care element 1	Care element 2	Care element 3	Care element 4	All elements performed
1	✓		✓	✓	
2	✓	✓		✓	
3	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	
5	✓	✓	✓	✓	✓
Total number of times an individual element was performed	5	4	4	4	2
% when element of care was given	100%	80%	80%	80%	40%

This example shows that while most care elements were performed on only two occasions were ALL elements performed correctly. Overall compliance with all elements was only 40% and as a result the risk of infection was significantly increased.

Best practice guides

EPIC guidelines⁵

The ICNA audit tool section on managing central venous catheters⁸

The American Centers for Disease Control guidelines⁹

Recommended resources

Many guidelines and papers are available in the National Resource for Infection Control at www.nric.org.uk

The NHS infection control e-learning package is available at www.infectioncontrol.nhs.uk

The American Kidney Disease Outcomes Quality Initiative has guidelines at www.kidney.org/professionals/KDOQI/guidelines.cfm

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To download further copies of all high impact interventions and calculator tools or to print/order extra hard copies, go to www.clean-safe-care.nhs.uk