

**Saving Lives:** reducing infection, delivering clean and safe care

# High Impact Intervention No 1

## Central venous catheter care bundle



### Aim

To reduce the incidence of catheter-related bloodstream infection (CR-BSI)

### Context

The Health Act 2006 Code of Practice<sup>1</sup> states that NHS organisations must audit key policies and procedures for infection prevention. The high impact intervention approach 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.

Bloodstream infections associated with central venous catheter insertion are a major cause of morbidity. A 2006 prevalence survey found that 42.3% of bloodstream infections in England are central line-related.<sup>2</sup> In 2000, the National Audit Office (NAO)<sup>3</sup> estimated the additional cost of a bloodstream infection to be £6,209 per patient.

The 2000 NAO report noted that 13% of the hospitals in its study had been using catheter care guidelines and that this had reduced the incidence of healthcare associated infection (HCAI). However, a follow-up report in 2004<sup>4</sup> noted that 10% of responding trusts had still not taken up the guidelines.

The Department of Health commissioned the EPIC group at Thames Valley University to produce a set of guidelines for the prevention of HCAI, in particular CR-BSI,<sup>5</sup> and the American Centers for Disease Control have also produced extensive guidelines for preventing CR-BSI.<sup>6</sup> The Department of Health document *Winning ways*<sup>7</sup> also makes recommendations on the management of central venous catheters and the Infection Control Nurses Association (ICNA) audit tool has a section on central venous catheter care.<sup>8</sup>

The use of central venous line insertion guidelines, together with a method for monitoring usage of these guidelines, has been shown to reduce significantly the incidence of CR-BSIs in intensive care units.<sup>9-12</sup>

## 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

#### Catheter type

- Single lumen unless indicated otherwise.
- Consider antimicrobial impregnated catheter if duration 1 to 3 weeks and risk of CR-BSI high.

#### Insertion site

- Subclavian or internal jugular.

#### 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

- Gloves are single-use items and should be removed and discarded immediately after the care activity.
- 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, transparent, semi-permeable 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.

#### Catheter site inspection

- Regular observation for signs of infection, at least daily.

#### Dressing

- An intact, dry, adherent transparent dressing should be present.

#### Catheter access

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

#### Administration set replacement

- Following administration of blood, blood products - immediately.
- Following total parenteral nutrition – after 24 hours (72 hours if no lipid).
- With other fluid sets – after 72 hours.

#### No routine catheter replacement

## 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](http://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](http://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 guidelines<sup>5</sup>

The ICNA audit tool section on managing central venous lines<sup>8</sup>

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## Recommended resources

Many guidelines and papers are available in the National Resource for Infection Control at [www.nric.org.uk](http://www.nric.org.uk)

The NHS infection control e-learning package is available at [www.infectioncontrol.nhs.uk](http://www.infectioncontrol.nhs.uk)

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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](http://www.clean-safe-care.nhs.uk)