

## High Impact Intervention

### Central venous catheter care bundle

#### Aim

To reduce the incidence of catheter related bloodstream infection (CRBSI).

#### Introduction

The aim of the care bundle, as set out in this high impact intervention (HII), is to ensure appropriate and high quality patient care. Regular auditing of the care bundle actions will support cycles of review and continuous improvement in care settings.

Registered providers must audit compliance against key policies and procedures for infection prevention, inline with the relevant legislation at the time of publication<sup>1</sup>.

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>. Treating one case of MRSA costs £5,200 at 2009-10 prices<sup>3</sup>.

The 2000 National Audit Office (NAO) report<sup>4</sup> 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>5</sup> noted that 10% of responding trusts had still not taken up the guidelines. In addition, the 2009 NAO report<sup>6</sup> identified that 95% of trusts had reduced the infection risk from use of catheters in their IP&C policies and 97% rated it as very important in reducing HCAs.

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 Catheter Related Blood Stream Infections (CRBSI)<sup>7</sup>. The American Centers for Disease Control have also produced extensive guidelines for preventing CRBSI<sup>8</sup>. The Infection Control Nurses Association (ICNA), (now the Infection Prevention Society) audit tool also has a section on central venous catheter care<sup>9</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 CRBSIs in intensive care units<sup>10-13</sup>. Dressings containing 2% chlorhexidine gluconate may also further reduce the incidence of catheter site infection<sup>14-15</sup>.

#### Why use the care bundle?

This care bundle is based on EPIC guidelines<sup>7</sup>, 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.

#### Staff competence and training:

In line with policy, staff should be appropriately trained and competent in any stated procedure or care process. Assessment of competence is not a specific care action within

the HII as it is a pre-requisite for any care delivered. Registered care providers will have mechanisms for assuring training, assessment and recording of competence.

### 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
<b>1. Catheter type</b> <ul style="list-style-type: none"> <li>Single lumen catheter is used unless otherwise indicated.</li> <li>Antimicrobial impregnated catheter is used if the duration is estimated to be of 1-3 weeks and the risk of CR BSI high.</li> </ul>
<b>2. Insertion site</b> <ul style="list-style-type: none"> <li>Catheter is inserted into the subclavian or internal jugular.</li> </ul>
<b>3. Personal protective equipment</b> <ul style="list-style-type: none"> <li>Maximal sterile barriers and aseptic technique, including a sterile gown, sterile gloves, and a large sterile drape, used for the insertion of a central venous access device.</li> <li>Eye/full protection is worn if there is a risk of splashed blood or other bodily fluids.</li> </ul>
<b>4. Skin preparation</b> <ul style="list-style-type: none"> <li>2% chlorhexidine gluconate in 70% isopropyl alcohol is used and allowed to dry for at least 30 seconds. <i>If a patient has a sensitivity use a single patient use povidone-iodine application.</i></li> <li>In line with local policy for neonates.</li> </ul>
<b>5. Hand hygiene</b> <ul style="list-style-type: none"> <li>Hands are decontaminated immediately before and after each episode of patient contact using the correct hand hygiene technique. <i>(Use of the World Health Organizations '5 moments of hand hygiene' or the NPSA 'Clean you hands campaign' is recommended).</i></li> </ul>
<b>6. Dressing</b> <ul style="list-style-type: none"> <li>A sterile, transparent, semi permeable dressing is used which allows observation of insertion site.</li> </ul>
<b>7. Safe disposal of sharps</b> <ul style="list-style-type: none"> <li>Sharps disposed of safely at the point of care and in line with local policy</li> </ul>
<b>8. Documentation</b> <ul style="list-style-type: none"> <li>Details of insertion are documented in the records (including date, location, catheter lot number and signature and name of operator undertaking insertion).</li> </ul>

Ongoing care actions
<b>1. Hand hygiene</b> <ul style="list-style-type: none"> <li>Hands are decontaminated immediately before and after each episode of patient contact using the correct hand hygiene technique. <i>(Use of the World Health Organizations '5 moments of hand hygiene' or the NPSA 'Clean you hands campaign' is recommended).</i></li> </ul>
<b>2. Site inspection</b> <ul style="list-style-type: none"> <li>Site is inspected daily for signs of infection and is recorded in the patient's record.</li> </ul>
<b>3. Dressing</b> <ul style="list-style-type: none"> <li>An intact, dry, adherent transparent dressing. is present.</li> <li>Insertion site should be cleaned with 2% chlorhexidine gluconate in 70% isopropyl alcohol prior to if dressing changed.</li> </ul>

#### **4. Catheter injection ports**

- Injection ports are covered by caps or valved connectors.

#### **5. Catheter access**

- Aseptic techniques are used for all access to the line.
- Ports or hubs are cleaned with 2% chlorhexidine gluconate in 70% isopropyl alcohol prior to catheter access.
- Flush line with 0.9% sodium chloride for lumens in frequent use.

#### **6. Administration set replacement**

- Set is replaced immediately after administration of blood/blood products.
- Set is replaced after 24 hours following total parenteral nutrition (if it contains lipids).
- Set is replaced within 72 hours of all other fluid sets.

#### **7. Catheter replacement**

- Catheter is removed if no longer required or decision not to remove is recorded.
- Details of removal are documented in the records (including date, location, and signature and name of operator undertaking removal).

### **Using the care bundle and the electronic tool**

The use of this care bundle will support cycles of review and continuous improvement, which will deliver appropriate and high quality patient care.

Audits of compliance with the care bundle should be carried out regularly and the results recorded at the point of care. They should be carried out by peers and the results can be collected manually or electronically depending on what is appropriate. The use of an electronic, graphical package such as the HII electronic tool provided is recommended, as this will increase the understanding and usefulness of the overall results.

The electronic tool will:

- Collect, collate and produce different views of the information.
- Clearly identify when actions within the care bundle have or have not been performed.
- Provide information to support the development of plans to resolve any issues and improve the quality of care.
- Support a culture of continuous Improvement.

### **Recording and making sense of the results**

- Print an audit sheet from the HII electronic tool or alternatively create one such as the example below.
- When a care bundle action is performed, insert a Y in the relevant column. If the action is not performed, insert an X in the relevant column.
- When the care action is not performed, as it is not applicable (for example local policy has determined it as not applicable in all or certain situations) insert an N/A to demonstrate that local policy is being adhered to. (This is then recognised as a Y when total compliance is being calculated).
- Calculate the totals and compliance levels manually or enter the results into the HII electronic tool to calculate these for you.
- The goal is to perform every appropriate action of care every time it is needed and achieve 100% compliance with the care bundle. The “All actions performed” column should be filled with a Y when all the appropriate actions have been completed on every required occasion. See the example below.
- Where actions have not been performed, overall compliance will be less than 100%. This provides immediate feedback for users of the tool on those care bundle actions not completed, and action can then be taken to improve compliance levels.

## Example audit sheet

<div> <div>Care Actions</div> <div>Observation</div> </div>	Care action 1	Care action 2	Care action 3	Care action 4	All actions
1	Y	N	Y	Y	N
2	Y	Y	N	Y	N
3	Y	Y	N/A	Y	Y
4	Y	Y	Y	N	N
5	Y	Y	Y	Y	Y
Total number of times an individual action was compliant	5	4	4	4	2
% when action of care was given	100%	80%	80%	80%	40%

- This example tool shows that while most care actions were performed, on only two occasions were ALL actions performed correctly while all actions was only 40% and as a result the risk of infection was significantly increased. (Please note for observation no 3. the N/A was calculated as a Y and overall compliance was achieved)
- When the information has been entered into the HII electronic tool a compliance graph for each action of care and for overall compliance with the care bundle can be produced. This will show where to focus the improvement efforts to achieve full compliance and achieve high quality patient care.

## References

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