

High Impact Intervention

Peripheral intravenous cannula care bundle

Aim

To reduce the incidence of peripheral intravenous cannula infections.

Introduction

The aim of the care bundle, as set out in this high impact intervention, 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 publication¹.

Peripheral intravenous cannula insertion is a commonly performed procedure, however has an associated risk of infection because of the potential for direct microbial entry to the bloodstream. Intravenous cannulae may be contaminated by the patient's skin flora at the insertion site, or by the introduction of other organisms via the cannula hub or injection port.

An Australian study² showed a bacteraemia rate of 1 per 3,000 cannulae, and more recently an infection rate of 0.2 per 1,000 intravenous cannula days has been demonstrated³.

The most commonly isolated organisms from all types of intravenous cannulae are coagulase-negative staphylococci (35%), with *Staphylococcus aureus* the second most common (25%)⁴. Meticillin resistant *Staphylococcus aureus* (MRSA) accounted for 40–45% of *Staphylococcus aureus* infections in a 2006 prevalence survey⁵.

The American Centers for Disease Control have produced extensive evidence-based guidelines for the prevention of infection associated with peripheral intravenous cannulae and central venous catheters⁶. Other countries have developed similar national guidelines^{7,8}. The Infection Control Nurses Association (ICNA) (now the Infection Prevention Society) audit tool⁹ also has a relevant section which covers similar points.

Why use the care bundle?

This care bundle is based on EPIC¹⁰ guidelines, expert advice and other national infection prevention and control guidance. It should support implementation of local and national policy. The purpose of the care bundle 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, or if not applicable comply with policy 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 actions
1. Aseptic Technique <ul style="list-style-type: none">▪ Procedure is carried out using a recognised aseptic technique.▪ Needle free device used when available.▪ A new cannula is used for each attempt.▪ Cannula is flushed in line with local policy.
2. Hand hygiene <ul style="list-style-type: none">▪ Hands are decontaminated immediately before and after each cannula insertion contact using the correct hand hygiene technique. <i>Use of the World Health Organizations '5 moments of hand hygiene' or the National Patient Safety Agency (NPSA) 'Clean you hands campaign' is recommended.</i>
3. Personal protective equipment <ul style="list-style-type: none">▪ Disposable apron and gloves to be worn and disposed of following use and between patients.
4. Skin preparation <ul style="list-style-type: none">▪ 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>▪ In line with local policy for neonates.
5. Dressing <ul style="list-style-type: none">▪ A sterile, semi-permeable, transparent dressing is used allowing observation of insertion site.
6. Documentation <ul style="list-style-type: none">▪ Document date, reason for insertion, catheter size, operator undertaking insertion and if insertion was high risk with signature.

Ongoing care actions
1. Hand hygiene <ul style="list-style-type: none">▪ 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>
2. Continuing clinical indication <ul style="list-style-type: none">▪ Indication for intravenous cannulae is assessed twice daily and cannulae is removed where it is no longer indicated.
3. Site inspection <ul style="list-style-type: none">▪ Documented review of cannula site for signs of infection i.e. (VIP Scoring) at least daily.
4. Dressing <ul style="list-style-type: none">▪ A sterile, semi-permeable, transparent dressing is used allowing observation of insertion site.
5. Cannula access <ul style="list-style-type: none">▪ 2% chlorhexidine gluconate in 70% isopropyl alcohol is used to decontaminate port and surrounding area, and allowed to dry prior to the administering fluid or injections via the cannulae. <i>If a patient has a sensitivity use a single patient use povidone–iodine application.</i>▪ Patency is maintained
6. Administration set replacement <ul style="list-style-type: none">▪ Immediately after administration of blood, blood products, lipids and TPN.▪ In line with local single use item policy, for intermittent administration All other fluid sets after 72 hours.
7. Cannula replacement <ul style="list-style-type: none">▪ Cannula re- sited before 72 hours or before if high risk insertion or clinically indicated.▪ Documented review of cannula site i.e. (VIP Scoring) at least daily.▪ Where venous access is limited, the cannula can remain in situ if there are no signs of infection and risk assessment undertaken.
8. Documentation <ul style="list-style-type: none">▪ Document in notes details of date and time of removal of cannula, operator undertaking removal with signature.

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 to 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
- Provides information to support the development of plans to resolve any issues and improve the quality of care
- Supports 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.
- 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 on those care bundle actions not completed, and action can then be taken to improve compliance levels.

Example

Care Actions Observation	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.

Best practice guides

The American Centers for Disease Control guidelines 6
The ICNA audit tool¹⁰ section on managing peripheral lines, page 41
Singapore Nursing Clinical Practice Guidelines⁷
Canadian Intravascular Access Devices Infection Control Guidelines⁸

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 available from www.infectioncontrol.nhs.uk

References

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