

Device-Related Infection Prevention Practices – DRIPP

Improvement Collaborative

Spreading best practice, reducing infections, improving outcomes for patients with urinary catheters and intravascular devices



High Impact Interventions for Vascular Access Devices

Introduction

These high impact interventions (HII) have been developed using evidence-based guidelines and a care bundle approach as a patient safety strategy to reduce the risk of infection associated with peripheral intravenous catheters (PIVC) and central venous access devices (CVAD). Each bundle comprises of a small number of essential elements within the clinical process. 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 actions of a care process are excluded or not performed.

Background

Vascular access devices (VAD) are required for many patients to deliver essential intravenous medicines and fluids as part of their treatment plan but these devices are not without risk of infection¹. Blood stream infections associated with the insertion and ongoing management of VADs are potentially among the most dangerous complications in healthcare².

The use of an aseptic technique is fundamental in minimising the risk of infection both during VAD insertion and ongoing management³. Aseptic technique is a generic term applied to a set of specific practices, including hand decontamination, use of personal protective equipment, and prevention of contamination of susceptible sites and sterile parts of devices^{1,2}. Aseptic Non Touch Technique (ANTT) is a specific and comprehensively defined type of aseptic technique with a unique theory-practice framework based on a concept of Key-Part and Key-Site Protection¹. Key-Parts and Key-Sites are protected by a combination of non-touch technique, standard infection prevention precautions and correct use of aseptic fields. This methodology uses two approaches: Standard-ANTT, used for clinical procedures where achieving asepsis is straightforward and short in duration, such as VAD flushing and locking, administration set preparation and change, intravenous medication administration and insertion of PIVC¹. Surgical-ANTT is used for more complex procedures such as CVAD insertion where the main aseptic field needs to be managed in a more critical manner with sterile drapes, a critical aseptic field, sterile gloves with full barrier precautions¹.

Healthcare staff performing any of the elements in the VAD bundles must be trained, skilled and competency assessed to decrease the risk of VAD related infections². In addition, information and education should be provided for patients and carers^{1,2,3}.

These care bundles are not intended to replace local procedural guidelines and policies but are a collection of essential elements selected from a systematic review of the effectiveness of insertion and maintenance bundles⁴. From the 13 studies in the systematic review the essential elements were selected by the frequency of use, improved outcomes and expert consensus from a working group of infection prevention and vascular access experts.

Further understanding of how to apply care bundles can be found on the Institute of Healthcare improvement <http://www.ihl.org>

Elements of the care process

There are two sets of actions for both PIVCs and CVADs to be implemented for best practice in the:

- a) insertion phase
- b) ongoing care phase

PIVC Insertion Bundle

	PIVC insertion bundle elements
1.	Assessment ^{1,2,3,5} Assess need for device incorporating type and duration of therapy, site selection, potential risk and vessel health and preservation
2.	Aseptic technique ^{1,2,3,5} Hands must be decontaminated by washing with soap and water or with an alcohol hand rub before insertion of the PIVC using ANTT (or other standardised aseptic technique)
3.	Skin antisepsis ^{1,2,3,5} Disinfect the skin with 2% CHG ⁷ in 70% alcohol using gentle repeated back-and-forth strokes and allow to dry
4.	Dressing and Documentation ^{1,2,3,5} Apply sterile transparent semi-permeable occlusive dressing. Document date and time of insertion, gauge, and site as a minimum

N.B. for patients with CHG sensitivity, alternatives should be determined locally

PIVC Ongoing care

	PIVC ongoing care bundle elements
1.	Assessment and documentation ¹⁻⁵ Inspect insertion site for signs of infection/complications and flush to assess patency at every access and at least each shift. Document findings and action taken, re-site when clinically indicated and remove when no longer needed
2.	Aseptic technique ^{1,2,3,5} Hands must be decontaminated by washing with soap and water or with an alcohol hand rub and use ANTT (or other standardised aseptic technique) when accessing a PIVC
3.	Scrub the hub ¹⁻⁵ Decontaminate hub (needle-free device) with 2% CHG in 70% alcohol for a minimum of 15 seconds and allow to dry

CVAD Insertion Bundle

	CVAD insertion bundle elements
1.	Assessment ^{1,2,3,6} Assess need for device incorporating type and duration of therapy, site selection, potential risk and vessel health and preservation
2.	Aseptic technique ^{1,2,3,6} Hands must be decontaminated by washing with soap and water or with an alcohol hand before CVAD insertion. ANTT (or other standardised aseptic technique) with maximal sterile barrier precautions (sterile gown, gloves, full body drapes, non-sterile cap, eye protection and face mask) must be used during CVAD insertion
3.	Skin antiseptics ^{1,2,3,6} Disinfect the skin with 2% CHG ⁷ in 70% alcohol using gentle repeated back-and-forth strokes and allow to dry
4.	Dressing and Documentation ^{1,2,3,6} Apply sterile transparent semi-permeable occlusive dressing impregnated with CHG and securement device. Document date and time of insertion, gauge, and site as a minimum ⁸

N.B. for patients with CHG sensitivity, alternatives should be determined locally

CVAD Ongoing care

	CVAD ongoing care bundle elements
1.	Assessment and documentation ^{1-3,5,6} Inspect insertion site for signs of infection/complications, flush to assess patency and assess dressing/securement device/skin integrity at every access and at least each shift. Document findings and action taken, re-site when clinically indicated and remove when no longer needed
2.	Aseptic technique ^{1,2,3,6} Hands must be decontaminated by washing with soap and water or with an alcohol hand rub and use ANTT (or other standardised aseptic technique) when accessing the CVAD
3.	Scrub the hub ^{1,2,3,5,6} Disinfect the hub (needle-free device) with 2% CHG in 70% alcohol for a minimum of 15 seconds and allow to dry

1. Gorski, L. A., Hadaway, L., Hagle, et al. (2021). Infusion therapy standards of practice. *Journal of Infusion Nursing*, 44 M., (supl1)
2. Loveday, H.P., Wilson, J.A., Pratt, R.J., et al. (2014). Epic3: National Evidence – Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals. *Journal of Hospital Infection*. S86, ppS1-S70
3. O’Grady N, Alexander M, Burns L, et al (2011) Guidelines for the Prevention in Intravascular Catheter-related Infections. CDC <https://www.cdc.gov/hai/pdfs/bsi-guidelines-2011.pdf>
4. Ray-Barruel G, Xu H, Marsh N, Cooke M, Richard C. (2019) Effectiveness of insertion and maintenance bundles in preventing peripheral intravenous catheter related complications and bloodstream infection in hospital patients: A systematic review, *Infection, Disease & Health*, <https://doi.org/10.1016/j.idh.2019.03.001>

5. Queensland Health. Peripheral intravenous catheter (PIVC) guideline: Queensland Health. 2015. Available from: https://www.health.qld.gov.au/_data/assets/pdf_file/0025/444490/icare-pivc-guideline.pdf
6. Royal Collage of Nursing (RCN). (2016) Standards of Infusion therapy 4th Edition RCN. London
7. Joint RCS/MHRA Statement on use of Topical Chlorhexidine for Skin Preparation Prior to Surgery (2020) ref: <https://www.rcseng.ac.uk/about-the-rcs/government-relations-and-consultation/joint-rcs-mhra-statement-on-use-of-tropical-chlorhexidine-for-skin-prep/>
8. The NHS England (2015) National Safety Standards for Invasive Procedures (NatSSIPs). <http://www.england.nhs.uk/ourwork/patientsafety/never-events/natssips/>