Benchmarking Central Venous Catheter Blood Stream Infections in Adult Critical Care
Network Guidance

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Background and Rationale

The impact of HCAIs on morbidity, mortality, length of stay and cost is well documented[1]; as such many interventions have been developed to reduce HCAI incidence.

A 2-year programme which started in April 2009 was called "Matching Michigan" in reference to an earlier American study which demonstrated a large reduction in catheter related BSI using a range of technical and behavioural interventions[2]. The Matching Michigan study observed a 60% reduction in CVC-BSI rates in adult ICUs after the intervention. This was adopted in the UK and demonstrated a reduction in CVC BSI [3]and following this conclusion the Infection in Critical Care Quality Improvement Programme (ICCQIP) was developed.

The NHSE Adult Critical Care Service Specification[4] stipulates that units should participate in ICCQIP and publish central venous catheter-related blood stream infection rates. Whilst many units have implemented strategies to minimise Health Care Associated Infections (HCAIs), in relation to CVC BSIs, many are unable to demonstrate the effectiveness of these interventions and there is no comparative data to provide assurance to individual Trusts, commissioners or the Network Clinical Advisory Board.

Within the Network regular audits are undertaken to benchmark and promote best practice in relation to CVC management. Whilst this provides assurance of the processes, there is a lack of comparative outcome data in terms of CVC related blood stream infections. By applying a standard definition for diagnosing CVC BSIs and submitting data to the network, this will enable benchmarking of infection rates and will provide assurance.

Abbreviations and Definitions

Central venous catheter (CVC) - a vascular catheter that ends close to or in the great vessels (femoral, subclavian, jugular, aorta etc.); this includes peripherally inserted central catheters. CVCs can be short or long term. Common names (not exclusive) are PICC, CVC, portocath, tesio, hickman, etc.

Central venous catheter bloodstream infection (CVC BSI) - a bloodstream infection thought to be related to/associated with a central venous catheter

Infection in Critical Care Quality Improvement Programme (ICCQIP) - a clinician-led collaboration of professional organisations in intensive care, healthcare epidemiology, microbiology and infection prevention and control hosted by Public Health England.

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[1] Eber MR, Laxminarayan R, Perencevich EN, Malani A. Clinical and economic outcomes attributable to health care-associated sepsis and pneumonia. Arch Intern Med 2010 Feb 22;170(4):347-53
[2] Pronovost P, Needham D, Berenholtz S, Sinopoli D, Chu H, Cosgrove S, et al. An intervention to decrease catheter-related bloodstream infections in the ICU. N Engl J Med 2006 Dec 28;355(26):2725-32.
[3] Bion J, Richardson A, Hibbert P, Beer J, Abrusci T, McCutcheon M, et al. 'Matching Michigan': a 2-year stepped interventional programme to minimise central venous catheter-blood stream infections in intensive care units in England. BMJ Qual Saf 2013 Feb;22(2):110-23.
[4] NHSE Adult Critical Care Service Specification: https://www.england.nhs.uk/wp-content/uploads/2019/05/220502S-adult-critical-care-service-specification.pdf

Aims and Objectives

A small number of units in the Critical Care Network submit data via the ICCQIP, which is considered to be the gold standard. The reason for this is the time required to collect the comprehensive data set and lack of time allocated to clinicians to complete this. As such, this guidance has been developed to ensure all units are collecting CVC BSI data using the same criteria and allowing regional benchmarking. By applying ICCQIP definitions it avoids any additional burden for units already engaged with the national programme. It is also a starting point for those considering joining the initiative.

The overall aim of this document is to provide a standard definition for critical care units in the network to determine if a blood stream infection is related to /associated with the presence of a CVC.
Following agreement and implementation of this guidance, each unit will seek to introduce a process to apply the CVC BSI definition which will facilitate monthly data collection and submission to the network including;

The total number of CVC BSI's
The total number of CVC days

This will enable regional benchmarking of CVC BSI rates and will drive improvement, link to existing benchmarking data and will support compliance with commissioning and professional standards.

Criteria to determine CVC BSI

Step 1	Step 2	Step 3
Evidence of a positive blood culture taken either: • 48 hours or more after CVC insertion **OR** • within 48 hours of a CVC being removed	Has a pathogen been cultured from at least one blood culture bottle? (Appendix 1) **OR** Has a common skin commensal (Appendix2) been cultured from 2 blood cultures drawn on separate occasions and taken within a 48hr period **AND** The patient has at least ONE symptom of fever >38°C, chills or hypotension?	Is it likely that the patients' signs, symptoms and positive blood results, including pathogen cultured from blood, are related to the CVC and NOT an infection from another site? *If unclear additional information to support diagnosis:* *I)quantitative CVC culture 103 CFU/ml or semi-quantitative CVC culture > 15 CFU* *II) quantitative blood culture ratio CVC blood sample/peripheral blood sample> 5* *III) differential delay of positivity of blood cultures: CVC blood sample culture positive 2 hours or more before peripheral blood culture (blood samples drawn at the same time)* *IV) positive culture with the same micro-organism from pus from insertion site* *V) symptoms improve within 48hr of removal of CVC* **Confirms diagnosis of CVC BSI**

Exclusions:
Repeat positive blood cultures taken within 7 days where the same organism(s) has/have been identified
NOTE: Subsequent positive blood cultures of a different species for the same patient should be reported as a new episode unless they are cultured within the same bottle/set

Treatment and management of identified CVC BSI's should follow local protocols.

Data Submission

Each month the network will collect data from each unit in the following format;

Unit:	(drop down list)
Month:	(drop down list)
Total No. of CVC line days	
Total No. of CVC BSIs	

Each unit to have an identified link person who will provide this information. Data to be submitted by the 4th of the following month.

An example data collection sheet for the CVC line days is provided in Appendix 3, but electronic patient records may be used to extract this information

Prevention of CVC BSI

The objectives of prevention are to reduce morbidity and mortality and reduce length of stay in ICU. There are many resources available to support best practice in relation to CVC insertion and on going care.

CVC Insertion Checklist

Local Safety Standards for Invasive Procedures (LocSSIPs) promote safe practice and reduce the risk of complications, with many units already using such checklists. The ICS and FICM have developed a CVC insertion checklist which is available for units to adapt if they do not currently have one, this can be found below and is accessible via this link: CVC_checklist_oct23_2.pdf (ficm.ac.uk)

INVASIVE PROCEDURE SAFETY CHECKLIST: CVC Insertion

The Faculty of Intensive Care Medicine | Intensive Care Society

BEFORE THE PROCEDURE		
Any known drug allergies?	Yes ☐	No ☐
Coagulation checked?	Yes ☐	No ☐
Is all equipment available? (including ultrasound if applicable)	Yes ☐	No ☐
Sterility of operator (hands scrubbed, appropriate personal protective equipment worn)	Yes ☐	
2% Chlorhexidine Gluconate / 70% isopropyl alcohol formulation (Chloraprep 2%) applied to procedure site and allowed to dry?	Yes ☐	
Use a large drape to cover the patient in a sterile manner	Yes ☐	

TIME OUT Verbal confirmation between team members before start of procedure		
Is patient position optimal?	Yes ☐	No ☐
All team members identified and roles assigned? (assistant to provide prompt for wire removal during procedure)	Yes ☐	
Correct line ready / integrity of line checked	Yes ☐	
Any concerns about procedure?	Yes ☐	No ☐
If you had any concerns about the procedure, how were these mitigated?		

SIGN OUT		
Correct injection site caps placed using sterile technique	Yes ☐	
Sterile dressing	Yes ☐	
Guidewire removed?	Yes ☐	No ☐
Chest X-Ray required/ordered	Yes ☐	No ☐
Any adverse events? (Documented in adverse events Log)	Yes ☐	No ☐
Transduce CVC CVP waveform present Record CVP - mmHG If any concerns perform paired CVC gas and ABG. pO_2 CVC = pO_2 ABG =	Yes ☐	No ☐

Procedure date:

Time:

Operator:

Observer:

Assistant:

Level of supervision: SpR ☐ Consultant ☐

Equipment & trolley prepared:

Patient Identity Sticker:

Signature of responsible clinician completing the form

INVASIVE PROCEDURE SAFETY CHECKLIST: CVC Insertion

The Faculty of Intensive Care Medicine | Intensive Care Society

During the procedure	
Sterile gloves and sterile gown worn by operator and assistant	Yes ☐
Hat and mask worn by operator and assistant	Yes ☐
Sterile field maintained	Yes ☐
Sterile sheath and sterile gel used with ultrasound probe (if applicable)	Yes ☐

Procedure	Cather type	Insertion site
☐ Elective	☐ Multi-lumen	☐ Subclavian
☐ Emergency	☐ Dialysis	☐ Jugular
☐ Re-wire	☐ Introducer/Sheath	☐ Femoral
Ultrasound used? Yes ☐ No ☐	☐ PICC/ Midline	☐ Right ☐ Left
	☐ ECMO / VAD	Guidewire Removed Yes ☐

CXR Review		
Appropriate position on CXR	Yes ☐	No ☐
Further actions required:		

Complications			
☐ Pneumothorax	☐ Arterial puncture / placement (follow unit policy for management)	☐ Malposition	☐ Haemorrhage
☐ 2nd person required	☐ Unable to cannulate	☐ Other	☐ None
Complication Actions/Comments:			

CVC On-going care benchmark audit

The regional audit programme already exists which is used to provide benchmark data from all critical care units in the North East and Yorkshire (NEY). One of the audits relates to the care of CVCs and the best practice elements are assessed and presented via network forums. In addition to the regular audit, units have access to best practice tools to support improvement. Examples of the audit and improvement resources are provided in the Appendices 4 and 5 and are also available via the network website.

Summary

This guideline provides a definition of CVC BSI that can be used to record and report the incidence on units. The collection and presentation of data at local unit and network forums will allow benchmarking and drive improvements in practice through collaboration. This approach is supporting compliance with ACC Service Specification Standards (DO5) and GPICS requirements.

Appendix 1- Recognised Pathogens

Pathogen	
ACHROMOBACTER SPECIES	GRAM POSITIVE BACILLI, NOT SPECIFIED /OTHER
ACINETOBACTER BAUMANNII	GRAM POSITIVE COCCI, NOT SPECIFIED /OTHER
ACINETOBACTER CALCOACETICUS	HAEMOPHILUS INFLUENZAE
ACINETOBACTER HAEMOLYTICUS	HAEMOPHILUS SP., NOT SPECIFIED /OTHER
ACINETOBACTER SP LWOFFI	HAEMOPHILUS PARAINFLUENZAE
ACINETOBACTER SP NOT SPECIFIED / OTHER	HAFNIA SPECIES
ACTINOMYCES SPECIES	HELICOBACTER PYLORI
AEROMONAS SPECIES	KLEBSIELLA SP., NOT SPECIFIED /OTHER
AGROBACTERIUM SPECIES	KLEBSIELLA OXYTOCA
ALCALIGENES SPECIES	KLEBSIELLA PNEUMONIAE
ANAEROBES, NOT SPECIFIED	LACTOBACILLUS SPECIES
OTHER ANAEROBES	LEGIONELLA SPECIES
ASPERGILLUS FUMIGATUS	LISTERIA MONOCYTOGENES
ASPERGILLUS NIGER	MORGANELLA SPECIES
ASPERGILLUS SP NOT SPECIFIED / OTHER	MORAXELLA CATHARRALIS
BACILLUS ANTHRACIS	MORAXELLA SP., NOT SPECIFIED /OTHER
BACTEROIDES FRAGILIS	MYCOBACTERIUM, ATYPICAL
BACTEROIDES SPECIES NOT SPECIFIED /OTHER	MYCOBACTERIUM TUBERCULOSIS COMPLEX
OTHER BACTERIA	MYCOPLASMA SPECIES
BURKHOLDERIA CEPACIA	NEISSERIA MENINGITIDIS
BURKHOLDERIA SPECIES	NEISSERIA SP., NOT SPECIFIED /OTHER
CAMPYLOBACTER SPECIES	NOCARDIA SPECIES
CANDIDA ALBICANS	OTHER PARASITES
CANDIDA GLABRATA	PASTEURELLA SPECIES
CANDIDA SP. NOT SPECIFIED /OTHER	PREVOTELLA SPECIES
CANDIDA PARAPSILOSIS	PROTEUS MIRABILIS
CANDIDA TROPICALIS	PROTEUS SP., NOT SPECIFIED /OTHER
CHLAMYDIA SPECIES	PROTEUS VULGARIS
CITROBACTER KOSERI (EX. DIVERSUS)	PROVIDENCIA SPECIES
CITROBACTER FREUNDII	PSEUDOMONAS AERUGINOSA
CITROBACTER SP NOT SPECIFIED /OTHER	PSEUDOMONADACEAE FAMILY, NOT SPECIFIED /OTHER
CLOSTRIDIUM DIFFICILE	SALMONELLA ENTERITIDIS
CLOSTRIDIUM OTHER	SALMONELLA SP., NOT SPECIFIED /OTHER
ENTEROBACTER AEROGENES	SALMONELLA TYPHIMURIUM
ENTEROBACTER AGGLOMERANS	SALMONELLA TYPHI OR PARATYPHI
ENTEROBACTER CLOACAE	SERRATIA LIQUEFACIENS
ENTEROBACTER GERGOVIAE	SERRATIA MARCESCENS
ENTEROBACTER SP., NOT SPECIFIED /OTHER	SERRATIA SP., NOT SPECIFIED /OTHER
ENTEROBACTER SAKAZAKII	SHIGELLA SPECIES
ENTEROCOCCUS FAECALIS	STAPHYLOCOCCUS AUREUS
ENTEROCOCCUS FAECIUM	STAPHYLOCOCCUS SP., OTHER
ENTEROCOCCUS SP NOT SPECIFIED /OTHER	STENOTROPHOMONAS MALTOPHILIA
ESCHERICHIA COLI	STREPTOCOCCUS AGALACTIAE
ENTEROBACTERIACEAE, NOT SPECIFIED/ OTHER	OTHER HAEMOL. STREPTOCOCCAE
FILAMENTS OTHER	STREPTOCOCCUS SP., NOT SPECIFIED /OTHER
FLAVOBACTERIUM SPECIES	STREPTOCOCCUS PNEUMONIAE
FUNGI, NOT SPECIFIED / OTHER	STREPTOCOCCUS PYOGENES
GARDNERELLA SPECIES	YEASTS, OTHER
OTHER GRAM- BACILLI, NON ENTEROBACTERIACIAEA	YERSINIA SPECIES
GRAM NEGATIVE COCCI, NOT SPECIFIED /OTHER	

Appendix 2- Skin Commensals

Skin Commensals	
AEROCOCCUS SPECIES	COAGULASE-NEGATIVE STAPHYLOCOCCI, NOT SPECIFIED/OTHER
BACILLUS SPECIES, OTHER	STAPHYLOCOCCUS EPIDERMIDIS
CORYNEBACTERIUM SPECIES	STAPHYLOCOCCUS HAEMOLYTICUS
MICROCOCCUS SPECIES	STREPTOCOCCUS (VIRIDANS GROUP)
PROPIONIBACTERIUM SPECIES	

Appendix 3 –CVC Line Days Example

Date	No. of CVC Lines										Total
	Bed 1	Bed 2	Bed 3	Bed 4	Bed 5	Bed 6	Bed 7	Bed 8	Bed 9	Bed 10	
1st Jan 2025	1	0	2	1	0	2	0	0	2	0	8
2nd Jan 2025	1	0	2	1	0	2	0	0	2	0	8
3rd Jan 2025	1	0	2	1	0	2	0	0	2	0	8
4th Jan 2025	1	0	2	1	0	2	0	0	2	0	8
5th Jan 2025	0	1	2	0	1	2	0	1	2	0	9
6th Jan 2025	0	1	2	0	1	2	0	1	2	0	9
7th Jan 2025	0	1	2	0	1	2	0	1	2	0	9
8th Jan 2025	0	1	2	0	1	2	0	1	2	0	9
9th Jan 2025	0	1	2	0	1	2	0	1	2	0	9
10th Jan 2025	0	1	2	0	1	2	0	1	2	0	9
11th Jan 2025	0	1	2	0	1	2	0	1	2	0	9
12th Jan 2025	0	1	2	0	1	2	0	1	2	0	9
13th Jan 2025	0	1	2	0	1	2	0	1	2	0	9
14th Jan 2025	0	1	2	0	1	2	0	1	2	0	9
15th Jan 2025	0	1	0	0	1	0	0	1	0	0	3
16th Jan 2025	1	1	0	1	1	0	1	1	0	1	7
17th Jan 2025	1	1	0	1	1	0	1	1	0	1	7
18th Jan 2025	1	1	0	1	1	0	1	1	0	1	7
19th Jan 2025	1	1	0	1	1	0	1	1	0	1	7
20th Jan 2025	1	1	0	1	1	0	1	1	0	1	7
21st Jan 2025	1	1	0	1	1	0	1	1	0	1	7
22nd Jan 2025	0	0	1	0	0	1	1	0	1	1	5
23rd Jan 2025	0	0	1	0	0	1	1	0	1	1	5
24th Jan 2025	0	0	1	0	0	1	1	0	1	1	5
25th Jan 2025	0	0	1	0	0	1	1	0	1	1	5
26th Jan 2025	0	0	1	0	0	1	1	0	1	1	5
27th Jan 2025	0	0	1	0	0	1	1	0	1	1	5
28th Jan 2025	1	0	1	1	0	1	1	0	1	1	7
29th Jan 2025	2	0	1	2	0	1	1	0	1	1	9
30th Jan 2025	2	0	1	2	0	1	1	0	1	1	9
31st Jan 2025	2	0	1	2	0	1	1	0	1	1	9
Total											**231**

Appendix 4 – NEY Benchmark Audit

NoECCN North of England Critical Care Network | North Yorkshire & Humberside Critical Care Network NHS | South Yorkshire and Bassetlaw Critical Care Operational Delivery Network | West Yorkshire Critical Care & Major Trauma Operational Delivery Networks

Central Venous Access Device Benchmark (CVAD)

Instructions

The following benchmark should be undertaken for patients with a central venous access device in situ such as Non-tunnelled Central Venous Catheter or VasCath
(NB not for patients with a PICC line, mid-line or a tunnelled catheter such as a Hickman line)
Within the month, select 5 patients (observations) and review their care.
If it is not possible to review 5 different patients, it is acceptable to review the care of a patient more than once in a different 24 hour period.
***Denotes where the past 24 hours of care should be used.**
Insert 1 for Yes, 0 for No or NA where appropriate from the drop down box.

Critical Care Unit	
Date	
Completed By	

Unit Questions (answer once only)				
Does your unit have a care bundles in place for CVAD insertion and maintenance? GPICS V2.1 (2022)		1=YES	0=NO	NA
Does your unit have local safety standards for invasive procedures for CVAD insertion? GPICS V2.1 (2022) ((NatSSIPs)				

	Care Element	**Observation 1**	**Observation 2**	**Observation 3**	**Observation 4**	**Observation 5**	**% when element of care was performed**
1	Is there documented evidence that an insertion checklist for the CVAD currently insitu has been used and does it include the elements agreed by Intensive Care Society and the Faculty of Intensive Care Medicine (Appendix 1) [2,4]						0%
2	Is there documented evidence of the date and time the line was inserted? (RCN 2016)						0%
3	Is the CVAD secured by sutures or with a sutureless catheter securement device? (RCN 2016)(Ullman 2017)						0%
4	Is the CVAD insertion site dressed with a sterile, transparent, semi-permeable polyurethane dressing (EPIC3 2014 IVAD17)? The dressing should be clean, dry and intact. (A chlorhexidine impregnated sponge dressing may be used (alternative if patient is allergic to chlorhexidine) in specific adult patient groups, e.g critical care, if part of a local strategy agreed with IPC to reduce CRBSI infections (EPIC3 2014 IVAD 20)).						0%
5	Is there evidence that the dressing has been replaced within the last 7 days? (EPIC3 2014 IVAD 18)						0%
6	Is there documented evidence that on the last dressing change the CVAD insertion site was cleaned using a single-use application of 2% chlorhexidine gluconate in 70% isopropyl alcohol (EPIC3 2014 IVAD 23)(or alternative if patient has chlorhexidine allergy) and asepsis was maintained?						0%
7	Observe an episode when the CVAD is accessed. Were **all** the following interventions observed: Hands were decontaminated with an alcohol-based hand rub or by washing with liquid soap and water (EPIC3 IVAD4) A single-use application of 2% chlorhexidine gluconate in 70% isopropyl alcohol (or povidone iodine in alcohol for patients with sensitivity to chlorhexidine) was used to decontaminate the access port or catheter hub for a minumum of 15 seconds and allowed to dry before accessing the system? (EPIC3 IVAD30) An ANTT was used when the CVAD was accessed? (EPIC3 IVAD5)						0%
8	Is there documented evidence that the CVAD insertion site has been assessed for signs of infection using a recognised assessment tool at least once per shift? (GPICS V2.1 2022)						0%
9	Is there documented evidence that lumens not used for continuous infusions have been flushed at least once per shift with sterile normal saline for injection to maintain patency? (EPIC3 IVAD34)*						0%
10	Have admisistration sets in continuous use (including trasnducer set) been changed within the last 96 hours? (unless advised otherwise by manufacturer, the line has become disonnected or the CVAD is replaced)(EPIC3 IVAD37).						0%
11	Have administration sets for blood and blood products been changed within the last 12 hours or when transfusion episode was completed (whichever is sooner)? (EPIC3 IVAD 38)						0%
12	Where TPN, or other lipid based solutions are infusing, are dedicated lumens being used? (EPIC3 IVAD7).						0%
13	Have administration sets for TPN or lipid based soulutions been replaced within the last 24 hours? EPIC3 2014 38						0%
14	Where the CVAD is used to monitor Central Venous Pressure, is the flush bag 0.9% NaCl **and** the pressure at 300mmHg? (Mallett, Albarran, Richardson 2013)*						0%
15	Where the CVAD is used to monitor Central Venous Pressure, is there documented evidence that the transducer been calibrated (zero'd) at least once per shift and on patient repositioning? (Mallett, Albarran, Richardson 2013)*						0%
16	Is there documented evidence of a daily review of the continued requirement for the CVAD to ensure the line is removed as soon as no longer required? (EPIC3 IVAD40)(GPICS V2.1 2022)*						0%
	Total Compliance						**0%**

References

1 Royal College of Nursing (2016) Standards for Infusion Therapy 4th Edition.

2 Bion J et al (2013) The Matching Michigan Collaboration & Writing Committee) Matching Michigan: A 2 year stepped nterventional programme to minimise central venous catheter blood stream infections in intensive care units in England. BMJ Quality&Safety 22:110-123

3 Loveday HP, Wilson JA, Pratt RJ, Golsorkhi M, Tingle A, Bak A, Brown J, Prieto J, Wilcox M UK Department of Health (2014) EPIC3: National Evidence based gudielines for preventing healthcare-associated infectiosn in NHS Hospitals. Journal of Hospital Infection Vol 86 (Supp 1) S1-S70.

4 Centre for Perioperative Care, National Safety Standards for Invasive Procedures 2 (NatSSIPs) https://cpoc.org.uk/sites/cpoc/files/documents/2022-12/CPOC_NatSSIPs2_Summary_2023.pdf

5 Mallett J, Albarran J, Richardson A (eds)(2013) Critical Care Manual of Clinical Procedures and Competencies. Wiley Blackwell.

6 Guidelines for the Provision of Intensive Care Services V2.1 (GPICS)(2022) The Faculty of Intensive Care Medicine / Intensive Care Society.

7 Ullman, A., Marsh, N. & Rickard, C. (2017) Securement for vascular access devices: Looking into the future. British Journal of Nursing, 26(8), S24–S26

Appendix 5- Central Venous Access Device Best Practice Guide

Collaborative Regional Benchmarking Group

Central Venous Access Device (CVAD) Management in Critical Care

Aim: To provide guidance on the management of central lines in Critical Care

Scope: All adult patients with central lines in Critical Care

ASSESS and DOCUMENT

- A CVAD insertion checklist should be used[2,4]
- Document date & time of insertion[1]
- Each shift assess and document insertion site for signs of infection using a recognised assessment tool[6]
- continued need for CVAD [3,6]

Central Venous Cannulation

Indications for CVAD's in critical care include :

- Administration of vasoactive drugs, drugs with high osmolality or extremes of pH.
- Repeated collection of blood specimens
- Administration of Total Parental Nutrition (TPN)
- Monitoring of central venous pressure (CVP)

	STANDARD CVAD MANAGEMENT
1	Effective hand hygiene and ANTT must be performed when accessing the CVAD for medication administration and blood sampling[3].
2	Ensure the CVAD is secured by sutures or with a sutureless catheter securement device[1]
3	Always 'scrub the hub' with 2% Chorhexidine*/70% alcohol for 15 seconds and allow to dry before and after medication administration and taking blood samples[3].
4	Administration lines must be changed as follows : • Continuous infusion lines and transducer sets at least every 96 hours • Blood /blood product administration lines at least every 12 hours or when transfusion episode is completed[3] • TPN/Lipid based solutions must have an exclusive lumen for administration and administration lines changed at least every 24 hours[3]
5	Aseptic technique must be used when changing the dressing. The insertion site must be cleaned with a single-use application of 2% chlorhexidine*/70% isopropyl alcohol. A sterile, semi permeable, polyurethane dressing should be used[3]. A chlorhexidine* impregnated sponge dressing may be used as part of local strategy. Change every 7 days or sooner if soiled, wet or no longer intact[3].
6	Ensure the CVP flush bag is 0.9% Normal Saline, the pressure is maintained at 300mmHg and the transducer has been calibrated (zero'd) each shift and after each patient repositioning[5].

ADDITIONAL CONSIDERATIONS

- Use of multi way connectors is acceptable providing this does not result in unnecessary, unused ports
- Any needle free ports in use should be changed as per manufacturers instructions
- Keep insertion site visible at all times if possible
- Lumens not used for continuous infusions should be flushed at least once per shift with sterile normal saline for injection to maintain patency[3]
- Consider the use of a daily wash with chlorhexidine* as part of local strategy to reduce Catheter Related Blood Stream Infections

*** use alternative if chlorhexidine allergy present.**

COMPLICATIONS

but not limited to :

- Infection
- Occlusion
- Dislodgement
- Air embolism
- Extravasation
- Thrombosis
- Pneumothorax
- Arrhythmias
- Arterial/Great vein puncture

Please see your units full guidelines for more information

(V3 2024)

noeccn
North of England Critical Care Network