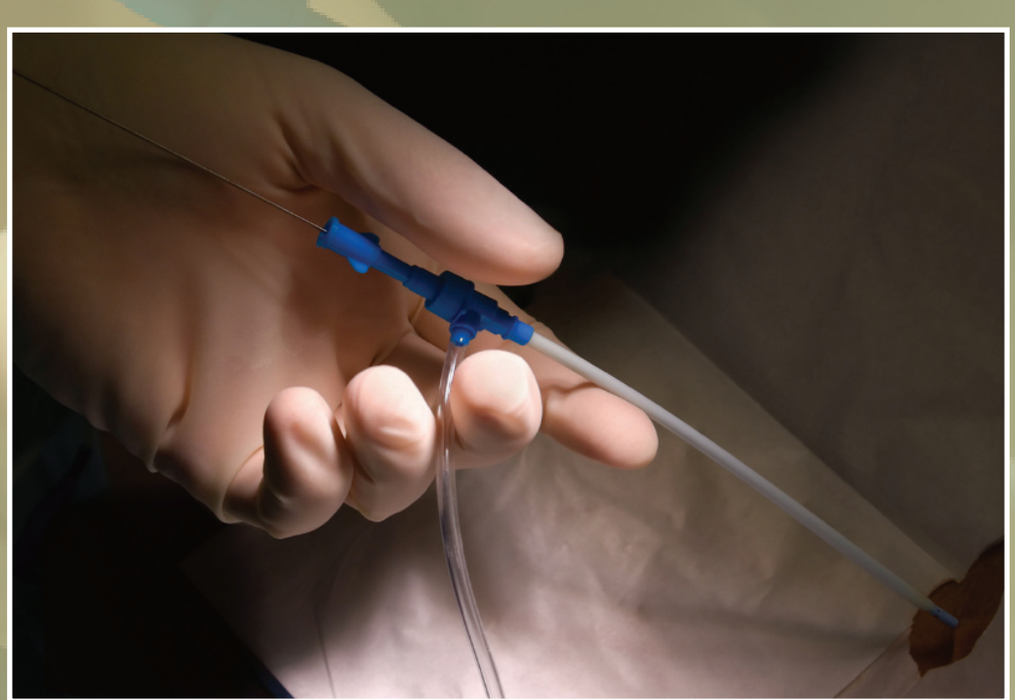
Health Protection Scotland

NHS National Services Scotland

Surveillance of Central Venous Catheter Related Infection Protocol

First Edition



ACKNOWLEDGMENTS

The HELICS protocol for Surveillance of Nosocomial Infections in Intensive Care (Hospital in Europe Link for Infection Control through Surveillance, 2004) has been used as a source in the preparation of this protocol. The case definitions and data definitions in this document are those specified by this protocol.

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If you have any comments or queries on this protocol or carrying out surveillance, we would be happy to hear from you.

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Acronyms used in relation to healthcare associated infection

BSI	Bloodstream infection
CDC	Centres for Disease Control and Prevention
CVC	Central Venous Catheter
CVP	Central Venous Pressure
CFU	Colony Forming Unit
FOI	Freedom of Information
HAI	Healthcare Associated Infection
HDL	Health Department Letter
HDU	High Dependency Units
HELICS	Hospital in Europe Link for Infection Control through Surveillance
HPS	Health Protection Scotland
ICU	Intensive Care Unit
NAO	National Audit Office
NHS	National Health Service
SSHAIP	Scottish Surveillance of Healthcare Associated Infection Programme

SECTION I
INTRODUCTION AND PRINCIPLES

1.1 Introduction

- The purpose of this protocol is to provide information, data definitions and instructions for national surveillance of central venous catheter (CVC) related infection in Scotland.
- For national surveillance a standardised methodology, including the use of a common set of definitions is required.

Surveillance is a multidisciplinary activity and local ownership is crucial. This protocol is intended for use by infection control teams, nurses, clinicians and all other personnel who are involved in CVC surveillance in Scotland.

1.1.a Definition of Surveillance

- Surveillance is the ongoing systematic collection, analysis, and interpretation of health data essential to the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know. The final link of the surveillance chain is the application of these data to prevention and control[1].
- Effective surveillance requires careful planning that is based on a clear understanding of its purpose, and awareness by those involved of the benefits and objectives of identified programmes.

The objectives of healthcare associated infection (HAI) surveillance are to:

- Monitor the incidence of infection
- Provide early warning and investigation of problems and subsequent planning and intervention to control at local level
- Monitor trends, including the detection of outbreaks
- Examine the impact of interventions
- Gain information on the quality of care
- Prioritise the allocation of resources

1.1.b Background to HAI Surveillance

- The white paper "Designed to Care"[2] suggested a new approach to quality of care within the NHS in Scotland. At the core of this approach is the issue of clinical governance. This has been referred to as "corporate accountability for clinical performance"[3] and indicates that NHS boards will need robust internal mechanisms for identifying quality problems, understanding their causes and acting to bring about quality improvements.
- HAI Action Plan

  Reducing the risk of Healthcare Associated Infection: HDL (2002)82[4]

  In November 2002, a major initiative to control HAI within the NHS in Scotland was launched. A Health Department Letter (2002)82[4] detailed the actions to be undertaken by NHS boards and other bodies to implement a wide ranging set of measures. Priority areas in the Action Plan were the development of a Code of Practice for local management of hygiene, mandatory training and induction courses in hygiene and infection control for staff, and the setting of technical requirements for cleaning processes and frequencies. A Task Force chaired by the Chief Medical Officer was set up to co-ordinate implementation, to monitor progress, to monitor levels of HAI and to report on progress to the Minister of Health and Community Care. NHS boards were also required to develop a plan to implement the recommendations, with certain recommendations being given high priority. A revised framework for national surveillance of HAI in Scotland was issued to NHS boards in July 2006 (HDL 2006)[5]. This revised framework reflected policy developments and formed part of the work programme for the Ministerial HAI Task Force.

1.2 Background to Central Venous Catheter Related Infection

Central venous catheters (CVC) are the leading cause of device-related bacteraemia[6]. CVC's are required for the repeated administration of chemotherapy, antibiotics, parental feeding, blood products, and for frequent blood sampling. They are recommended for patients in whom long-term (>30 days) central venous access is anticipated and indicated for intensive access[7]. Due to the duration and severity of treatment, patients frequently require CVC's for prolonged periods of time. Although these devices provide life-saving vascular access, their invasive nature puts these patients at risk of life-threatening local and systemic infections[8].

As the risk of systemic infection increases with the duration of dwell time, patients may be vulnerable not only to infections as a consequence of their disease but also to infections as a consequence of their healthcare[9]. The presence of other pre-existing sites of infection will also increase the risk[10]. Bloodstream infections (BSI) associated with the insertion & maintenance of CVC are among the most dangerous complications of healthcare that can occur worsening the severity of the patient's underlying ill health, prolonging the period of hospitalisation and increasing the cost of care.

BSI associated with CVC insertion are a major cause of morbidity. A 2006 prevalence survey found that 42.3% of bloodstream infections in England are central line-related[11]. In 2000, the National Audit Office (NAO)[12] estimated the additional cost of a bloodstream infection to be £6,209 per patient. In 2007 the Scottish National HAI Prevalence Survey reported that 3.2% of patients had CVC *in situ*[13].

In recognition of the above and as a result of there being no current method for surveillance for this group of patients with CVC's a methodology for enhanced incidence surveillance for patients with CVC's has been developed for use by local staff.

SECTION 2
SETTING UP SURVEILLANCE

2.1 The Aims of the CVC Surveillance Programme are:

- To collect surveillance data on CVC within NHS boards to inform clinical priorities and practice locally.

2.2 Who Should be Involved?

Surveillance primarily involves clinical staff, including infection control teams.

2.2.a Key Roles

There are key roles, which ensure effective surveillance:

Key role 1: Local CVC surveillance co-ordinator

It is anticipated that the local co-ordinator will be a member of the infection control team or another member of staff with strong links with infection control, for example a member of the clinical effectiveness team. His/her key functions are anticipated to be strategic at this local level and include:

- Identifying key stakeholders
- Liaison at local level to ensure selection of an appropriate specialty for CVC surveillance
- Facilitating the setting up process
- Ensure continuing involvement from the clinical teams
- Collate data and check for accuracy/completeness

Key Role 2: Data Collector

The data collector and surveillance co-ordinator may be the same person, however this may be any member of the infection control team, a surveillance nurse or other suitable member of staff at the individual site.

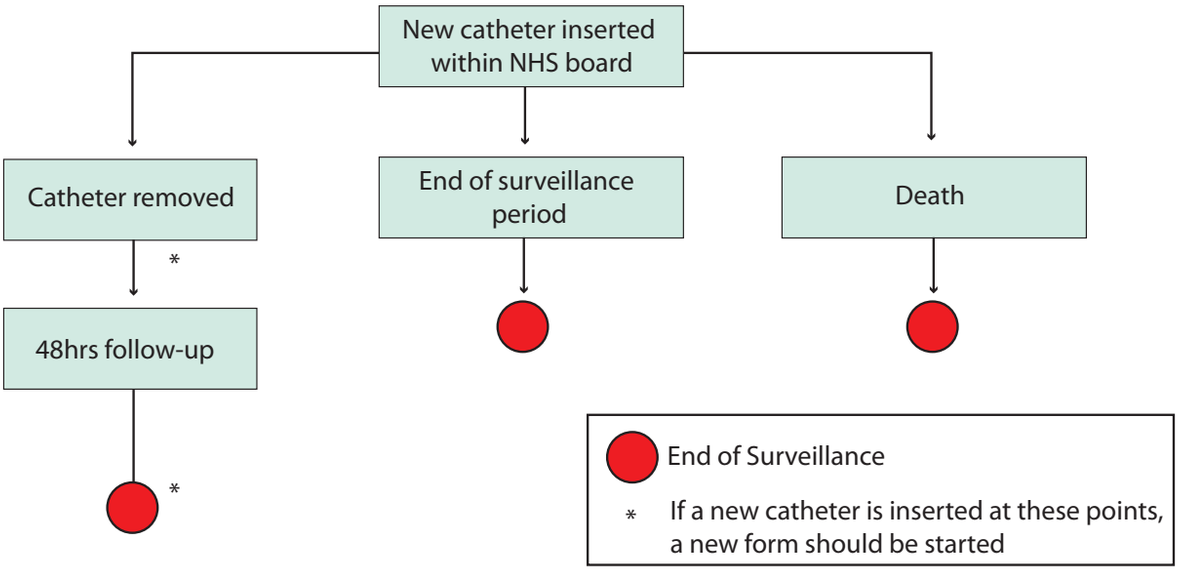
- Visit wards to identify catheterised patients and patients with infections
- Review patient notes, laboratory reports and record data
- Completes surveillance, admission and ward admission data

2.3 Points to Consider When Setting Up Surveillance

2.3.a Inpatient Pathways for CVC Surveillance

The flowchart in Figure 1 represents the pathways for CVC surveillance, whether or not a CVC related infection occurs during any part of the pathway.

Figure 1: Patient Pathways for CVC Surveillance

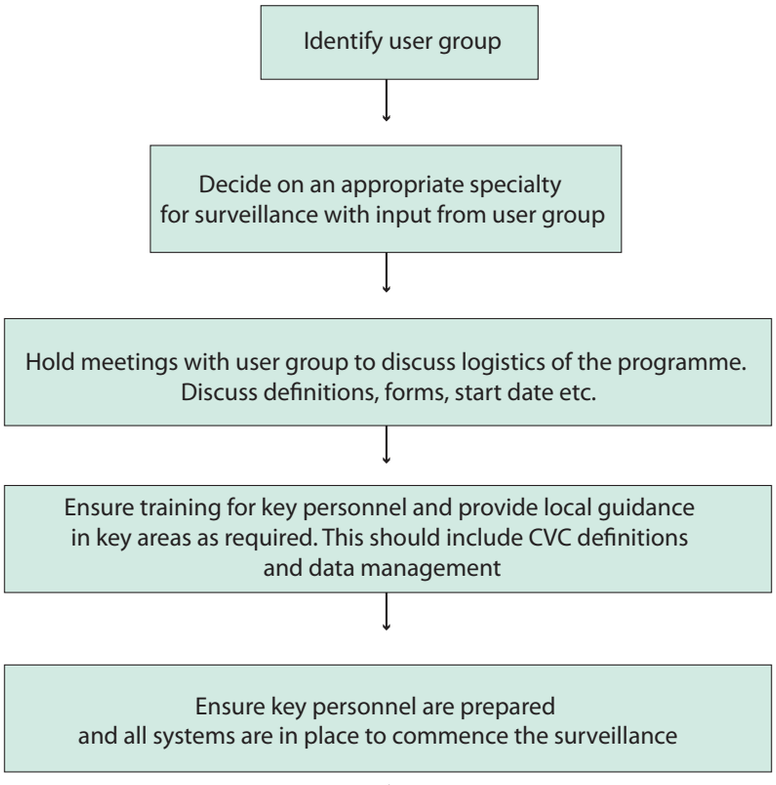


2.3.b Setting Up Surveillance

The flowchart in Figure 2 represents the key requirements for surveillance, to assist with setting up surveillance locally.

Figure 2: Setting Up Surveillance – Flowchart

The local CVC surveillance co-ordinator should liaise locally and manage the following activities:



2.3.c Training of data collectors

It is crucial to maintain a consistent approach to data collection and interpretation of infection definitions. To achieve this, data collection documentation has been developed in order to ensure that definitions are applied consistently.

2.4 Admission Data

Admission data are required for each ward within the chosen specialty. These should be collected for each day.

The data required are:

- Number of patients with new CVC inserted each day*

  * If a patient has more than one CVC inserted then each CVC should be recorded

Note: Only those patients admitted to the ward **under the chosen specialty** should be included in the admission data.

This information should be collected using the appropriate Central Venous Catheter Form and Central Venous Catheter Surveillance Ward Submission Worksheet shown in Appendix III and IV respectively.

- This admission data can be obtained in a way that is convenient at your hospital.

SECTION 3
PROTOCOL

3.1 Identification of the Study Population

A methodology is required to ensure that all patients who have a new CVC inserted are identified and included in surveillance. Staff should be fully aware of which patients are under surveillance.

- **All patients** with a new CVC inserted *must* be monitored for the development of CVC related infection and be included in surveillance.
- A CVC is defined as an intravascular catheter that terminates at or close to the heart or in one of the great vessels which is used for infusion, withdrawal of blood, or hemodynamic monitoring.

3.2 Monitoring Patients for CVC

- Surveillance ends 48hrs after the catheter is removed, the patient dies, or the surveillance period ends.

3.2.a Identification of catheterised patients

Within the unit the number of all new CVC inserted should be captured to identify and record those patients with CVC related infections.
Information from (i) nursing records, (ii) medical notes and charts, and (iii) ward staff are required to ensure that all catheterised patients are identified.

3.2.b Identification of patients with CVC related infections

- Review all positive microbiology reports from the chosen specialty on a daily basis and select those from patients in the study population.
- In addition, medical and nursing records, temperature and treatment charts, as well as information from ward staff, should be used to identify patients with CVC related infections.
- The case definitions and data definitions in this document are those specified by the HELICS protocol for Surveillance of Nosocomial Infections in Intensive Care Units.
- Date of CVC related infections **onset** should be recorded as the day the first positive specimen is taken or the day the clinician diagnoses the infection. All relevant signs and symptoms of CVC related infections should also be recorded on the form.

3.3 Exclusion Criteria

The following patients will be **EXCLUDED** from CVC surveillance if:

- The CVC **was inserted before the start** of the CVC surveillance period.
- They are **not from the chosen specialty** but are nursed in a ward designated to the chosen specialty

3.4 CVC Core Dataset

1. Patient and Admission Details

Q1	NHS board Code
Q2	Patient CHI number
Q3a	Hospital Admission Date
Q3b	Date Admitted to the Specialty
Q4	Sex
Q5	Age of patient

2. Catheterisation Details

Q6a	Date of CVC Insertion
Q6b	Length of time of CVC insertion
Q7a	Insertion site of CVC
Q7b	Type of CVC
Q8a	Location of Patient when CVC Inserted
Q8b	Other Location of Patient when CVC Inserted
Q9a	Reason for Catheterisation
Q9b	Other Reason for Catheterisation
Q10a	Previous Period of Catheterisation
Q10b	Was the CVC removed within the last 48hrs

3. Infection Details

Q11	CVC Related Infection Present
Q12	Date of Infection Onset
Q13	Criteria Used to Determine CVC related infection
Q14	Causative Micro organism
Q15	Micro organisms Antibiotic Sensitivity

4. End of Surveillance

Q16	Date of CVC Removal
Q17a	Reason for Ending Surveillance
Q17b	Other Reason for Ending Surveillance
Q18	Date Surveillance Ended

An example data collection form is given on Appendix III

3.5 Data Definitions

The surveillance form consists of individual data items. In this section, each data item is defined. In addition, comments, reporting instructions and the rationale for collecting the data are given where relevant.

Data Item

The name given to the data item e.g. Patient code

Response required

Single response question will only allow one box to be selected
Multiple response questions will allow more than one box to be selected
Numerical question will accept only numerical characters
Alphanumerical question will accept numbers and letters within frames

Classification of data items

Required: response must be completed on every procedure performed
Conditional: response is conditionally required when the requirement for data is dependent on the response given to other items
Optional: response is optional

Definition

Reason for inclusion of item and desired response
Some questions are self explanatory and therefore do not require a definition

Choices

The choices that are available under the item. Numerical frames do not have choices

Rationale

An explanation of why a question has been included or framed in a particular manner where appropriate

Comments

Additional information

Reply format

Cross box ☒
Number and date frames (write from left to right and clearly within the frames)
Not documented dates should be recorded 09/09/9999 or other fields 9 as appropriate.
Not applicable dates should be recorded as 10/10/1010.

Data Definitions

Data item **NHS board code**

Response Numerical question will accept numbers within frames

Classification Required

Definition NHS board in which the catheter is inserted and surveillance is taking place.

Choices No choices

Reply Numeric frame 3 characters.

Data item **Patient CHI number**

Response Numerical question will accept numbers within frames

Classification Required

Definition Code given to patient locally

Choices No choices

Rationale This is required for quality assurance checking and for retrieval of missing data retrospectively.

Reply Numeric frame 10 characters

Data item **Hospital admission date**

Response Numerical question will accept numbers within frames

Classification Required

Definition Date patient was admitted to the hospital

Choices DD/MM/YYYY

Rationale Allows patient length of stay to be evaluated as a risk factor.

Reply Date frame
If the exact date is not documented, record as 09/09/9999

Data item **Date admitted to specialty**

Response Numerical question will accept numbers within frames

Classification Optional

Definition Date patient was admitted to the specialty

Choices DD/MM/YYYY

Rationale Allows patient length of stay in the specialty to be evaluated as a risk factor.

Reply Date frame
If the exact date is not documented, record as 09/09/9999

Data item **Sex**

Response Single

Classification Required

Definition Gender of the patient

Choices Male
Female
Not recorded

Rationale Allows gender to be assessed as a risk factor for CVC related infection.

Reply ☒

Data item **Age of patient**

Response Numerical question will accept numbers within frames

Classification Required

Definition Patient's age

Ch**oice**s None

R**ation**ale Allows age to be assessed as a risk factor for CVC.

Reply Number frame up to 3 digits
If the age is not documented, record as 999

Data item **Date of CVC insertion**

Response Numerical question will accept numbers within frames

Classification Required

Definition Date of catheter insertion

Choices DD/MM/YYYY

Rationale Allows the number of days of catheterisation and the interval between catheterisation and onset of infection to be calculated.

Reply Date frame
If the exact date is not documented, record as 09/09/9999

Data item **Length of time of CVC insertion**

Response Single

Classification Required

Definition How long the catheter is estimated to be inserted for

Choices Short-term (<30 days)
Long-term (>30 days)
N/R

Rationale Allows the length of time of catheter to be assessed as a risk for CVC related infection.

Reply ☒

Data item **Insertion site of CVC**

Response Single

Classification Required

Definition Location of site where the catheter was inserted in the patient

Choices Basilic
Femoral
Jugular
Median cubital
Subclavian
Unspecified
N/R

Rationale Allows the site location of catheterisation to be assessed as a risk for CVC related infection.

Reply ☒

Data item **Type of CVC**

Response Single

Classification Required

Definition Type of catheter inserted

Choices Tunnelled
Implanted port
Peripherally inserted central catheter (PICC)
Temporary
Unspecified
N/R

Rationale Allows the type of catheter to be assessed as a risk for CVC related infection.

Reply ☒

Data item **Location of patient when CVC inserted**

Response Single

Classification Required

Definition Location of patient when the catheter was inserted

Choices Within NHS board
Other (specify)
Not recorded

Rationale Allows the location of catheterisation to be documented. Patients who have there CVC inserted within another NHS board should have their result recorded as other with the location recorded in Q8b.

Reply ☒

Data item **Reason for catheterisation**

Response Single

Classification Required

Definition The reason for catheterisation in this individual patient

Choices Monitoring of the central venous pressure (CVP)
Chemotherapy
Dialysis
Long-term intravenous antibiotics
Long-term parenteral nutrition
Frequent blood draws
Other (specify)
Not recorded

Rationale Provides data to allow the reason for catheter insertion to be assessed as a risk factor for CVC related infection

Reply ☒

Data item **Previous period of catheterisation**

Response Single

Classification Required

Definition Any previous period of catheterisation should be recorded.

Choices Yes
No
Not recorded

Rationale To allow previous catheterisation to be assessed as a risk factor for CVC related infection

Reply ☒

Comment If previous period of catheterisation is not known, choose "not recorded"

Data item **Was the CVC removed within the last 48hrs?**

Response Single

Classification Required

Definition The CVC was removed within the last 48hrs.

Choices Yes
No
Not Recorded

Rationale To allow a CVC removal within the last 48hrs to be assessed as a risk factor for CVC related infection

Reply ☒

Comment If length of previous catheter insertion is not known, choose "not recorded"

Data item **CVC Related Infection Present?**

Response Single

Classification Required

Definition A healthcare acquired, CVC related infection is defined as[14]:

CRI1: Local CVC-related infection (no positive blood culture)

- Quantitative CVC culture $\geq 10^3$ CFU/ml or semi-quantitative CVC culture > 15 CFU

AND

- Pus inflammation at the insertion site or tunnel

CRI2: General CVC-related infection (no positive blood culture)

- Quantitative CVC culture $\geq 10^3$ CFU/ml or semi-quantitative CVC culture > 15 CFU

AND

- clinical signs (Fever (>38°C), chills, or hypotension) improve within 48 hours after catheter removal

CRI3: CVC-related BSI

- BSI (see below) occurring 48 hours before or after catheter removal

AND positive culture with the same micro organism of **EITHER**:

- Quantitative CVC culture $\geq 10^3$ CFU/ml or semi-quantitative CVC culture > 15 CFU
- Quantitative blood culture ratio CVC blood sample/peripheral blood sample> 5
- Differential delay of positivity of blood cultures: CVC blood sample culture positive 2 hours or less before peripheral blood culture (blood samples drawn at the same time)
- Positive culture with the same micro organism from pus from insertion site

BSI:

- 1 positive blood culture for a recognised pathogen

OR

- Patient has ***at least one*** of the following signs or symptoms: fever (>38°C.), chills, or hypotension

AND

- 2 positive blood cultures for a common skin contaminant (from 2 separate blood samples drawn within 48hrs).

Skin contaminants:

Coagulase-negative staphylococci
Micrococcus sp.
Propionibacterium acnes
Bacillus sp.
Corynebacterium sp.

Choices Yes
No
Not Recorded

Rationale To record if a CVC related infection was present.

Comments Patients that develop a CVC related infection are still included in surveillance until they meet the criteria for ending surveillance.

Reply ☒

Data item **Date of infection onset**

Response Numerical question will accept numbers within frames

Classification Conditionally required

Definition The date when CVC related infection was diagnosed using the definition for CVC related infection.

Choices DD/MM/YYYY

Rationale To calculate the number of days from insertion of catheter to onset/detection of infection (and to distinguish between episodes)

Reply Date frame
If the exact date is not documented, record as 09/09/9999

Data item **Criteria used to determine CVC related infection**

Response Multiple

Classification Conditionally required

Definition Indicate which of the listed criteria were used to diagnose CVC

Choices Quantitative CVC culture $\geq 10^3$ CFU/ml
Semi-quantitative CVC culture > 15 CFU
Pus inflammation at the insertion site or tunnel
Fever (>38°C) (improves within 48hrs after catheter removal)
Chills (improves within 48hrs after catheter removal)
Hypotension (improves within 48hrs after catheter removal)
Quantitative blood culture ratio CVC blood sample/peripheral blood sample> 5
Differential delay of positivity of blood cultures: CVC blood sample culture positive 2hrs or less before peripheral blood culture (blood samples drawn at the same time)
Positive culture with the same micro organism from pus from insertion site
One positive blood culture
Two positive blood cultures for a common skin contaminant

Skin contaminants:
Coagulase-negative staphylococci
Micrococcus sp.
Propionibacterium acnes
Bacillus sp.
Corynebacterium sp.

Rationale Required for national and local reporting and allows verification of criteria used for defining infection.

Comments Multiple choice- cross all boxes that apply.

Reply ☒

Data item **Causative micro organism**

Response Multiple (up to three). Numerical question will accept numbers within frames

Classification Conditionally required

Definition The micro organism(s) considered to be the cause of the CVC related infection. A maximum of three organisms can be recorded from laboratory reports.

Choices Use the appropriate 3 digit code(s) listed in Appendix I.

Rationale To monitor trends in pathogens responsible for CVC related infection

Comments If the laboratory report states "mixed growth", this should be reported 001

Reply Number Frame- 3 digits

Data item **Micro organism antibiotic sensitivity**

Response Alphanumerical

Classification Conditionally required

Definition The antibiotic sensitivities of the micro organisms causing infection taken from laboratory reports. Up to six antibiotics can be reported on the form.

Choices Use the three letter abbreviation given in Appendix II.

Rationale To allow collection of data to monitor antimicrobial resistance and susceptibility of pathogens causing CVC related infection.

Reply Alphanumerical- 3 Letters

Data item **Date of CVC removal**

Response Numerical

Classification Required

Definition Date CVC was removed

Choices DD/MM/YYYY

Rationale Allows the number of days of CVC *in situ* to be calculated.

Reply Date frame
If the exact date is not documented, record as 09/09/9999

Comments If the catheter is *in situ* at end of surveillance period, record 10/10/9999.
If patient dies then record date of death as date of CVC removal and record patient's death in Q17a.

Data item **Reason for ending surveillance**

Response Single

Classification Required

Definition Reason why surveillance has ceased for this individual patient

Choices CVC removed plus 48hrs follow-up
End of surveillance period
Patient died during surveillance period
Not recorded
Other. Please specify reason.

Rationale Required for national and local reporting.

Reply ☒

Data item **Date surveillance ended**

Response Numerical

Classification Required

Definition Date the surveillance was discontinued

Choices DD/MM/YYYY

Rationale To calculate the number of catheter days to determine CVC rates.

Reply Date frame
If the exact date is not documented, record as 09/09/9999

SECTION 4
QUALITY ASSURANCE

Quality Assurance

- Forms should be checked for completeness by the local project co-ordinator.
- Forms should be checked for accuracy.
- Denominator (all patients with new catheters inserted) checks should routinely be carried out to ensure all patients have had forms completed.
- Admission data checks should routinely be carried out to ensure accurate admission data, for example, checks from Medical Records.

SECTION 5
REFERENCES

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SECTION 6
APPENDICES

APPENDIX I
NINSS STANDARD CODES FOR MICRO ORGANISMS

I. BACTERIA

001	Mixed growth
010	*Acinetobacter* spp.
012	*Acinetobacter baumannii (anitratus)*
014	*Acinetobacter lwoffii*
030	*Aeromonas* spp.
050	*Alcaligenes* spp.
071	Anaerobic cocci (unspecified)
090	*Bacillus* spp.
110	*Bacteroides* spp.
113	*Bacteroides fragilis* group
130	*Burkholderia (Pseudomonas)* spp.
132	*Burkholderia cepacia*
160	*Chryseomonas* spp.
180	*Citrobacter* spp.
182	*Citrobacter diversus (koseri)*
184	*Citrobacter freundii*
200	*Clostridium* spp.
202	*Clostridium difficile*
204	*Clostridium perfringens*
206	*Clostridium septicum*
221	Coliforms (unspecified)
240	*Corynebacterium* spp.
242	*Corynebacterium jeikeium*
251	Diphtheroids (unspecified)
270	*Enterobacter* spp.
272	*Enterobacter aerogenes*
274	*Enterobacter agglomerans*
276	*Enterobacter cloacae*
290	*Enterococcus* spp
292	*Enterococcus faecalis.*
294	*Enterococcus faecium*
311	*Escherichia coli*
330	*Flavobacterium* spp.
350	*Fusobacterium* spp.
380	*Haemophilus* spp.
382	*Haemophilus influenzae*
384	*Haemophilus parainfluenzae*
400	*Hafnia* spp.
420	*Klebsiella* spp.
422	*Klebsiella pneumoniae (aerogenes)*
424	*Klebsiella oxytoca*
450	*Legionella* spp.
452	*Legionella pneumophila*
470	*Listeria* spp.
472	*Listeria monocytogenes*

490	*Micrococcus* spp.
510	*Moraxella* spp.
512	*Moraxella (Branhamella) catarrhalis*
531	*Morganella morganii*
552	*Mycobacterium avium*
554	*Mycobacterium chelonae*
556	*Mycobacterium fortuitum*
558	*Mycobacterium tuberculosis*
559	*Mycobacterium* - other spp.
570	*Neisseria* spp.
572	*Neisseria meningitidis*
590	*Nocardia* spp.
592	*Nocardia asteroids*
620	*Peptococcus* spp.
630	*Peptostreptococcus* spp.
640	*Prevotella* spp.
650	*Propionibacterium* spp.
670	*Proteus* spp.
672	*Proteus mirabilis*
674	*Proteus vulgaris*
690	*Providencia* spp.
692	*Providencia alcalifaciens*
694	*Providencia rettgeri*
696	*Providencia stuartii*
710	*Pseudomonas* spp.
712	*Pseudomonas aeruginosa*
732	*Salmonella enteritidis*
734	*Salmonella typhi*
739	*Salmonella* -other spp.
750	*Serratia* spp.
752	*Serratia liquefaciens*
754	*Serratia marcescens*
770	*Staphylococcus aureus,* methicillin - resistant (MRSA)
772	*Staphylococcus aureus,* methicillin - sensitive (MSSA)
780	*Staphylococcus,* coagulase - negative (CNS)
782	*Staphylococcus epidermidis*
783	*Staphylococcus haemolyticus*
784	*Staphylococcus hominis*
785	*Staphylococcus lugdunensis*
786	*Staphylococcus saprophyticus*
787	*Staphylococcus schleiferi*
801	*Stenotrophomonas (Xanthomonas) maltophilia*
821	*Streptococcus agalactiae* (group B)

822	*Streptococcus bovis*
823	*Streptococcus pneumoniae*
824	*Streptococcus pyogenes* (group A)
825	*Streptococcus* 'viridans group'
829	*Streptococcus* - other aerobic spp.
840	*Yersinia* spp.
842	*Yersinia enterocolitica*
860	Other Gram-negative bacteria
870	Other Gram-positive bacteria
880	Other anaerobes
890	Other bacteria

II. Fungi / Yeasts

910	*Aspergillus* spp.
920	*Candida* spp.
922	*Candida albicans*
924	*Candida tropicalis*
940	Other fungi/yeasts

APPENDIX II
ANTIBIOTICS CODES

Antibiotics Codes

CODE	ANTBIOTIC
FCT	5-Fluorocytosine
ACM	Acetylmidecamycin
ASP	Acetylspiramycin
AMK	Amikacin
AMX	Amoxicillin
AMC	Amoxicillin/Clavulanic acid
AXS	Amoxicillin/Sulbactam
AMB	Amphotericin B
AMP	Ampicillin
SAM	Ampicillin/Sulbactam
AMR	Amprolium
APL	Apalcillin
APR	Apramycin
ARB	Arbekacin
APX	Aspoxicillin
AST	Astromicin
AVI	Avilamycin
AVO	Avoparcin
AZM	Azithromycin
AZL	Azlocillin
ATM	Aztreonam
BAM	Bacampicillin
BAC	Bacitracin
BIA	Biapenem
BCZ	Bicozamycin
BDP	Brodimoprim
BUT	Butoconazole
CAP	Capreomycin
CRB	Carbenicillin
CAR	Carumonam
CAC	Cefacetrile
CEC	Cefaclor
CFR	Cefadroxil
RID	Cefaloridin
MAN	Cefamandole
CTZ	Cefatrizine
CZD	Cefazedone
CZO	Cefazolin
CFB	Cefbuperazone
CCP	Cefcapene
CDR	Cefdinir
DIT	Cefditoren
FEP	Cefepime

CODE	ANTBIOTIC
CAT	Cefetamet
CPI	Cefetamet pivoxil
CCL	Cefetecol (Cefcatacol)
CZL	Cefetrizole
CFM	Cefixime
CID	Cefonicid
CFP	Cefoperazone
CSL	Cefoperazone/Sulbactam
CND	Ceforanide
CTX	Cefotaxime
CTC	Cefotaxime/Clavulanic acid
CTS	Cefotaxime/Sulbactam
CTT	Cefotetan
CTF	Cefotiam
CHE	Cefotiam hexetil
FOX	Cefoxitin
ZOP	Cefozopran
CFZ	Cefpimizole
CPM	Cefpiramide
CPO	Cefpirome
CPD	Cefpodoxime
CPX	Cefpodoxime proxetil
CPR	Cefprozil
CRD	Cefroxadine
CFS	Cefsulodin
CSU	Cefsumide
CAZ	Ceftazidime
CCV	Ceftazidime/Clavulanic acid
CEM	Cefteram
CTB	Ceftibuten
TIO	Ceftiofur
CZX	Ceftizoxime
CRO	Ceftriaxone
CXA	Cefuroxime axetil
CXM	Cefuroxime sodium
ZON	Cefuzonam
LEX	Cephalexin
CEP	Cephalothin
HAP	Cephapirin
CED	Cephradine
CTO	Cetocycline
CHL	Chloramphenicol
CTE	Chlortetracycline

CODE	ANTBIOTIC
CIC	Ciclacillin
CIN	Cinoxacin
CIP	Ciprofloxacin
CLR	Clarithromycin
CLA	Clavulanic acid
CLX	Clinafloxacin
CLI	Clindamycin
CTR	Clotrimazole
CLO	Cloxacillin
COL	Colistin
CMX	Cefmenoxime
CMZ	Cefmetazole
CNX	Cefminox
CDZ	Cefodizime
DKB	Dibekacin
DIC	Dicloxacillin
DIF	Difloxacin
DIR	Dirithromycin
DOX	Doxycycline
ECO	Econazole
ENX	Enoxacin
ENR	Enrofloxacin
EPE	Eperozolid
EPP	Epiroprim
ETP	Ertapenem
ERY	Erythromycin
ETH	Ethambutol
ETI	Ethionamide
ETO	Etopabat
FAR	Faropenem
FLA	Flavomycin
FLE	Fleroxacin
FLO	Flomoxef
FLR	Florfenicol
FLC	Flucloxacillin
FLU	Fluconazole
FLM	Flumequine
FOS	Fosfomycin
FMD	Fosmidomycin
FRM	Framycetin
FRZ	Furazolidone
FUS	Fusidic acid
GAT	Gatifloxacin
GEM	Gemifloxacin
GEN	Gentamicin

CODE	ANTBIOTIC
GEH	Gentamicin-High
GRX	Grepafloxacin
GRI	Griseofulvin
HAB	Habekacin
HET	Hetacillin
HYG	Hygromycin
IPM	Imipenem
ISE	Isepamicin
ISO	Isoconazole
INH	Isoniazid
ITR	Itraconazole
JOS	Josamycin
KAN	Kanamycin
KAH	Kanamycin-High
CYC	Cycloserine
DFX	Danofloxacin
DAP	Daptomycin
DEM	Demeclocycline
LOM	Lomefloxacin
LOR	Loracarbef
MEC	Mecillinam (Amdinocillin)
MEL	Meleumycin
MEM	Meropenem
MES	Mesulfamide
MET	Methicillin
MTP	Metioprim
MXT	Metioxate
MTR	Metronidazole
MEZ	Mezlocillin
MSU	Mezlocillin/Sulbactam
MCZ	Miconazole
MCR	Micromomicin
MID	Midecamycin
MIL	Miloxacin
MNO	Minocycline
MON	Monensin sodium
MOX	Moxalactam (Latamoxef)
MFX	Moxifloxacin
MUP	Mupirocin
NAF	Nafcillin
NAL	Nalidixic acid
NAR	Narasin
NEO	Neomycin
NET	Netilmicin
NIC	Nicarbazin

CODE	ANTBIOTIC
NIF	Nifuroquine
NIT	Nitrofurantoin
NIZ	Nitrofurazone
NTR	Nitroxoline
NOR	Norfloxacin
NVA	Norvancomycin
NOV	Novobiocin
NYS	Nystatin
OFX	Ofloxacin
OLE	Oleandomycin
OPT	Optochin
ORS	Ormetropim/Sulfamethoxine
ORN	Ornidazole
OXA	Oxacillin
OXO	Oxolinic acid
OXY	Oxytetracycline
PAS	P-Aminosalicylic acid
PAN	Panipenem
KET	Ketoconazole
KIT	Kitasamycin (Leucomycin)
LAS	Lasalocid
LVX	Levofloxacin
LIN	Lincomycin
LSP	Linco-spectin
LNZ	Linezolid
PPA	Pipemidic acid
PIP	Piperacillin
PIS	Piperacillin/Sulbactam
TZP	Piperacillin/Tazobactam
PRC	Piridicillin
PRL	Pirlimycin
PIR	Piromidic acid
POL	Polymixin B
PRX	Premafloxacin
PRM	Primycin
PRI	Pristinamycin
PRP	Propicillin
PKA	Propikacin
PTH	Prothionamide
PZA	Pyrazinamide
QDA	Quinupristin/Dalfopristin
RAC	Ractopamine
RIB	Rifabutin
RIF	Rifampin
ROK	Rokitamycin

CODE	ANTBIOTIC
ROS	Rosoxacin
RXT	Roxithromicin
SAL	Salinomycin
SAR	Sarafloxacin
SRX	Sarmoxicillin
SIS	Sisomicin
SPX	Sparfloxacin
SPT	Spectinomycin
SPI	Spiramycin
STR	Streptomycin
STH	Streptomycin-High
SUL	Sulbactam
SBC	Sulbenicillin
SUC	Sulconazole
SUP	Sulfachlorpyridazine
SDI	Sulfadiazine
SUD	Sulfadimethoxine
PAR	Paromomycin
PEF	Pefloxacin
PEN	Penicillin G
PNV	Penicillin V
PNO	Penicillin/Novobiocin
PIM	Pentisomicin
PTZ	Pentizidone
SDM	Sulfadimidine
SZO	Sulfamazone
SUM	Sulfamethazine
SMX	Sulfamethoxazole
SNA	Sulfasuccinamide
SUT	Sulfathiazole
SOX	Sulfisoxazole
SSS	Sulfonamides
TLP	Talmetoprim
TAZ	Tazobactam
TEC	Teicoplanin
TLT	Telithromycin
TMX	Temafloxacin
TEM	Temocillin
TCY	Tetracycline
TET	Tetroxoprim
THA	Thiacetazone
THI	Thiamphenicol
TIA	Tiamulin
TIC	Ticarcillin
TCC	Ticarcillin/Clavulanic acid

CODE	ANTBIOTIC
TBQ	Tilbroquinol
TIL	Tilmicosin
TIN	Tinidazole
TDC	Tiodonium chloride
TXC	Tioxacin
TOB	Tobramycin
TFX	Tosufloxacin
TMP	Trimethoprim

CODE	ANTBIOTIC
SXT	Trimethoprim/Sulfamethoxazole
TRL	Troleandomycin
TRO	Trospectomycin
TVA	Trovafloxacin
TYL	Tylosin
VAN	Vancomycin
VIO	Viomycin
VIR	Virginiamycine

APPENDIX III
CENTRAL VENOUS CATHETER SURVEILLANCE FORM*

*Please contact SSHAIP Team to provide an electronic non water marked form for use locally.

Health Protection Scotland

Central Venous Catheter Surveillance Form

NHS National Services Scotland

1. Patient and Admission Details

Please write inside number and date frames or place a cross [X] in the appropriate box using a black pen

Q1 NHS Board Code [ ][ ][ ]

Q2 Patient CHI number [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Q3a Hospital Admission Date D D / M M / Y Y Y Y

Q3b Date Admitted to Specialty D D / M M / Y Y Y Y

If N/R then enter 0 9 / 0 9 / 9 9 9 9

Q4 Sex Mark [X] in appropriate box ☐ Male ☐ Female ☐ N/R

Q5 Age of patient → [ ][ ][ ] yrs

If N/R enter 9 9 9

2. Catheterisation Details

Q6a Date of CVC Insertion D D / M M / Y Y Y Y → If N/R then enter 0 9 / 0 9 / 9 9 9 9

Q6b Length of time of CVC insertion Mark [X] in appropriate box

☐ Short-term (< 30 days) ☐ Long-term (>30 days) ☐ N/R

Q7a Insertion site of CVC Mark [X] in appropriate box

☐ Basilic ☐ Femoral ☐ Jugular ☐ Median cubital ☐ Subclavian ☐ Unspecified ☐ N/R

Q7b Type of CVC Mark [X] in appropriate box

☐ Tunnelled ☐ Implanted port ☐ Peripherally inserted central catheter (PICC) ☐ Trolley ☐ Unspecified ☐ N/R

Q8a Location of Patient when CVC Inserted

Mark [X] in appropriate box

☐ Within NHS Board

☐ Other (please specify in Q8b)

☐ N/R

Q8b Other Location of Patient when CVC Inserted

[ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Q9a Reason for Catheterisation

Mark [X] in appropriate box

☐ Monitoring of the CVP ☐ Long-term Parenteral nutrition

☐ Chemotherapy ☐ Frequent blood draws

☐ Dialysis ☐ N/R

☐ Long-term Intravenous antibiotics ☐ Other (please specify in Q9b)

Q9b Other Reason for Catheterisation

[ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Q10a Previous Period of Catheterisation

Mark [X] in appropriate box

☐ Yes, answer Q10b ☐ No ☐ N/R →

Q10b Was the CVC removed within the last 48hrs?

Mark [X] in appropriate box

☐ Yes ☐ No ☐ N/R

3. Infection Details

Q11 CVC Related Infection Present?

Mark [X] in appropriate box

☐ Yes →

☐ No (Please answer Q16 and onwards)

Q12 Date of Infection Onset D D / M M / Y Y Y Y

If N/R then enter 0 9 / 0 9 / 9 9 9 9

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Health Protection Scotland

Central Venous Catheter Surveillance Form

NHS National Services Scotland

3. Infection Details cont.

Please write inside number and date frames or place a cross [x] in the appropriate box using a black pen

Q13 Criteria Used to Determine CVC Related Infection - Record all diagnostic criteria that apply

Mark [x] in one or more relevant boxes

- ☐ Patient has CVC *in situ*
- ☐ Patient had a CVC removed within 48hrs before infection onset
- ☐ Quantitative CVC culture ≥ 10 CFU/ml
- ☐ Semi quantitative CVC culture > 15 CFU
- ☐ Pus inflammation at the insertion site or tunnel
- ☐ Chills
- ☐ Hypotension
- ☐ Fever (≥ 38 °C skin temperature)
- ☐ Quantitative blood culture ratio CVC blood sample/peripheral blood sample> 5
- ☐ Differential delay of positivity of blood cultures
- ☐ Positive culture with the same micro-organism from pus from insertion site
- ☐ 1 positive blood culture for a recognised pathogen
- ☐ 2 positive blood cultures for a common skin contaminant

Q14a Micro Organism 1	Q14b Micro Organism 2	Q14c Micro Organism 3
Micro Organism Code 1	Micro Organism Code 2	Micro Organism Code 3

Q15a Micro Organism 1 Antibiotic Sensitivity		Q15b Micro Organism 2 Antibiotic Sensitivity		Q15c Micro Organism 3 Antibiotic Sensitivity	
Sensitive	Resistant	Sensitive	Resistant	Sensitive	Resistant

4. End of Surveillance

Q16 Date of CVC Removal D D / M M / Y Y Y Y → If in situ at end of surveillance 1 0 / 1 0 / 9 9 9 9

If N/R then enter 0 9 / 0 9 / 9 9 9 9

Q17a Reason for Ending Surveillance Mark [x] in appropriate box

☐ CVC removed plus 48hrs follow-up ☐ End of surveillance period ☐ Patient died during surveillance period ☐ N/R ☐ Other

Q17b Other Reason for Ending Surveillance

Q18 Date Surveillance Ended D D / M M / Y Y Y Y → If N/R then enter 0 9 / 0 9 / 9 9 9 9

END OF FORM

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APPENDIX IV
CENTRAL VENOUS CATHETER SURVEILLANCE WARD SUBMISSION WORKSHEET

Health Protection Scotland

CVC Surveillance Ward Submission Worksheet

NHS National Services Scotland

Q1. Board Code

Q2. Surveillance Period (Month)

Day of month	Number of admissions to the ward or unit each day
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
Total	

Day of month	Number of patients with new CVC inserted each day*
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
Total	

*** If a patient has more than one CVC inserted then each CVC should be recorded**