This SOP applies to all staff employed by NHS Greater Glasgow & Clyde (Acute Operating Division) and locum staff on fixed term contracts.

**SOP Objective**

To ensure the safe insertion and maintenance of tunnelled and non-tunnelled central venous catheters (CVC) to avoid harm to patients.

This SOP encompasses all CVC which provide central venous access in adult patients’ outwith critical care areas.

Critical care areas, i.e. intensive care / therapy units have existing insertion and maintenance documentation.

This SOP provides succinct information on the insertion, maintenance and good practice points of these invasive devices and is underpinned by the NHSGGC Vascular Access Policy.

**SOP updated September 2015** to include:

- Health Protection Scotland’s revised Key Recommendations for preventing infections when inserting and maintaining a central vascular catheter (CVC).

**Document Control Summary**

<table>
<thead>
<tr>
<th>Approved by and date</th>
<th>Board Infection Control Committee 19 May 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of Publication</td>
<td>26 May 2014</td>
</tr>
<tr>
<td>Developed by</td>
<td>Infection Prevention and Control Team, Practice Development and Interventional Radiology</td>
</tr>
<tr>
<td>Related Documents</td>
<td>NHSGGC Administration of Intravenous Medicines Policy (Acute Adult)</td>
</tr>
<tr>
<td>Implications of Race Equality and other diversity duties for this document</td>
<td>This policy must be implemented fairly and without prejudice whether on the grounds of ethnicity, gender, sexual orientation, religion, belief, disability or age.</td>
</tr>
<tr>
<td>Lead Manager</td>
<td>Board Infection Control Manager</td>
</tr>
<tr>
<td>Responsible Director</td>
<td>Board Medical Director</td>
</tr>
</tbody>
</table>
CVC Care Bundle

A care bundle is a group of evidence-based interventions when implemented together result in better outcomes than when implemented individually. The science supporting each bundle component is sufficiently established to be considered the standard of care.

The bundle is not intended to be a comprehensive list of all elements of care related to CVC’s; rather the bundle approach to a small group of interventions.

Compliance with the bundle is measured by adherence to all elements of the bundle. If all elements have been accomplished, or if an element is documented as medically contraindicated, the bundle is counted as complete for that patient.

The approach has been most successful when all elements are executed together, an “all-or-none” strategy. If any of the elements are absent, this is deemed non-compliance.

NHSGGC CVC insertion and maintenance bundle elements

The NHSGGC CVC bundle has been collaboratively developed by clinical teams and the IPCT. It is based on the Health Protection Scotland (HPS) CVC bundle and will support optimal care for adults with a CVC within non-critical care areas.

In General Adult Wards, every CVC must have supporting documentation to evidence that the correct insertion technique and correct interventions are fully maintained for each patient.

The CVC must be checked at least once per day and the NHSGGC CVC Insertion and Maintenance Care Plan must be fully completed to ensure optimal practice to avoid patient harm.

Insertion: When inserting a CVC ensure that:

1. Surgical scrub is performed before application of maximal sterile barrier precautions.
2. Sterile barrier precautions are used; hat, mask, sterile gown and sterile gloves (Operator and Assistant).
3. Sterile drape used to cover whole patient.

4. Aseptic technique maintained throughout insertion procedure.

5. Skin prepared by decontamination of the insertion site using 2% Chlorhexidine gluconate in 70% isopropyl alcohol and allowed to dry completely.

6. The subclavian site is used if possible or internal jugular vein*. (The femoral site should be avoided whenever possible. If used record in variance section).

7. A sterile, transparent semi-permeable dressing is used to cover the catheter site.

* The internal jugular vein is the preferred site for CVC insertion by NHSGGC clinicians. This is in alignment with NHSGGC policy.

Maintenance:
When maintaining an inserted CVC and accessing the insertion site and line ensure that:

1. The requirement for the CVC in situ is reviewed and recorded on a daily basis.

2. The CVC dressing is intact. (If not intact, the dressing must be changed.)

3. Hand hygiene is performed immediately before accessing the site or line.

4. The CVC dressing has been changed in the last 7 days.

5. Chlorhexidine gluconate 2% in 70% isopropyl alcohol is used for cleaning the insertion site during dressing changes.

6. An antiseptic containing Chlorhexidine gluconate 2% in 70% isopropyl alcohol is used to clean the access hub (needle free device) for at least 15 seconds** [Scrub the Hub]. Allow to dry completely before accessing line.

** NHSGGC Administration of Intravenous Medicines Policy (Acute Adult) advocates 30 seconds.
**Practice points**

Needlefree connectors must be attached to all the catheter lumen unless clinically contraindicated.

**Do not use a needlefree device with haemodialysis catheters.**

If the patient has a **haemodialysis catheter** and outwith renal service, **do not use** unless as an emergency and contact the Renal on-call team as soon as possible for advice.

The access hubs of dialysis lines should be cleaned for 30 seconds.

In addition, each time the dressing is changed the exit site should be assessed for any signs of infection. If the site is red or discharging then take a swab for microbiological investigations, and blood cultures obtained if pyrexial, using both peripheral veins and via line, and inform the medical team immediately.

**Removal of sutures in tunnelled CVCs**

A tunnelled CVC will have two sites; entry and exit site.

- The entry site is closed with skin closures or sutures and a sterile gauze dressing. This should be left intact for 7 days. The skin closures / sutures are removed after 7 days and the healed wound can be left exposed.

- The anchoring suture at the exit site is removed after 3 week once the Dacron cuff has embedded into the subcutaneous tract.

- Dialysis catheters (Tesio / Ash spilt) should have sutures removed no later than 6 weeks maximum.
The NHSGGC CVC care plan is detailed below:

**Adult Central Venous Cannula (CVC) Insertion & Maintenance – General wards***

**Insertion – When inserting a CVC ensure that:**
1. Surgical scrub is performed before application of maximal sterile barrier precautions.
2. Sterile barrier precautions are used: hat, mask, sterile gown & sterile gloves (Operator & Assistant).
3. Sterile drape used to cover whole patient.
4. Aseptic technique maintained throughout insertion procedure.
5. Skin prepared by decontamination of the insertion site using 2% Chlorhexidine gluconate in 70% isopropyl alcohol and allowed to dry completely.
6. The Subclavian site is used if possible or internal jugular** vein. (The femoral site should be avoided whenever possible. If used record in variance section). [**] vein is the preferred site for CVC insertion by NHSGGCclinicians. This is in alignment with NHSGGC policy.
7. A sterile, transparent semi-permeable dressing is used to cover the catheter site.

**Good practice includes the documenting of the date & time of CVC insertion. This provides a baseline for ongoing catheter maintenance and to enable timely line removal when clinically no longer required.**

**CVC Insertion details – please record any variances in section below**

<table>
<thead>
<tr>
<th>Where inserted:</th>
<th>Date/time inserted</th>
<th>Insertion site</th>
<th>□ Emergency</th>
<th>Inserted by (Name &amp; Designation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED □ Theatre □ ITU/HDU □ Interventional Radiology □ Ward/other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clinical Indication</th>
<th>Name</th>
<th>IV Fluids/IV Medication</th>
<th>Chemotherapy</th>
<th>Urgent access</th>
<th>Total Parenteral Nutrition</th>
<th>Haemodialysis</th>
<th>Other Please state</th>
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<tbody>
<tr>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Insertion Criteria (If no please explain in variance section below)</th>
<th>1. Surgical scrub Yes □ No □</th>
<th>2. &amp; 3. Maximal sterile barrier precautions Yes □ No □</th>
<th>4. Aseptic technique Yes □ No □</th>
<th>5. Skin prep Yes □ No □</th>
<th>6. Subclavian or if vein used Yes □ No □</th>
<th>7. Sterile transparent semi-permeable dressing affixed Yes □ No □</th>
<th>Other Please state</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of CVC (Tunneled/Non-tunneled) please record</th>
<th>Real time Ultrasound Guidance Yes □ No □</th>
<th>If used: Guidewire removed &amp; intact Yes □ No □ N/A □</th>
<th>Position tip confirmed by Chest X-ray (if applicable) Yes □ No □ N/A □</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Needle free device placed on end port(s) (As per CCC protocol)</th>
<th>Yes □ No □ N/A □</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variance recording:</th>
<th></th>
</tr>
</thead>
</table>

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The most up-to-date version of this policy can be viewed at the following website: [www.nhsggc.org.uk/infectionpreventionandcontrol](http://www.nhsggc.org.uk/infectionpreventionandcontrol)
**NHSGGC CVC care plan**

The most up-to-date version of this policy can be viewed at the following website:

[www.nhsggc.org.uk/infectionpreventionandcontrol](http://www.nhsggc.org.uk/infectionpreventionandcontrol)

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### Maintenance – When maintaining an inserted CVC and accessing the insertion site and line ensure that:

1. The requirement for the CVC in situ is reviewed and recorded on a daily basis.
2. The CVC dressing is intact. (If not intact, the dressing must be changed)
3. The CVC dressing has been changed in the last 7 days.
4. Chlorhexidine gluconate 2% in 70% isopropyl alcohol is used for cleaning the insertion site during dressing changes.
5. Hand hygiene is performed immediately before accessing the site or line.
6. An antiseptic containing Chlorhexidine gluconate 2% in 70% isopropyl alcohol is used to clean the access hub (needle free device) for at least 15 seconds [Scrub the Hub]. Allow to dry completely before accessing line.

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### Maintenance – To be completed daily (Observe for signs and symptoms of local or systemic infection)

<table>
<thead>
<tr>
<th>Day &amp; Date</th>
<th>Has the need for CVC been reviewed today?</th>
<th>Any sign of CVC infection?</th>
<th>The CVC dressing is intact?</th>
<th>Hand hygiene performed?</th>
<th>Exit site, line and hubs cleaned with 2% Chlorhexidine in 70% IPA?</th>
<th>Aseptic non touch technique used?</th>
<th>CVC is locked/flushed as per local guidelines?</th>
<th>What has been done?</th>
<th>Date dressing due changed</th>
<th>Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1 <strong><strong><strong>/</strong></strong></strong>_</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Left in situ</td>
<td>Removed</td>
</tr>
<tr>
<td>Day 2 <strong><strong><strong>/</strong></strong></strong>_</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Left in situ</td>
<td>Removed</td>
</tr>
<tr>
<td>Day 3 <strong><strong><strong>/</strong></strong></strong>_</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Left in situ</td>
<td>Removed</td>
</tr>
<tr>
<td>Day 4 <strong><strong><strong>/</strong></strong></strong>_</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Left in situ</td>
<td>Removed</td>
</tr>
<tr>
<td>Day 5 <strong><strong><strong>/</strong></strong></strong>_</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Left in situ</td>
<td>Removed</td>
</tr>
<tr>
<td>Day 6 <strong><strong><strong>/</strong></strong></strong>_</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Left in situ</td>
<td>Removed</td>
</tr>
<tr>
<td>Day 7 <strong><strong><strong>/</strong></strong></strong>_</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Yes □ No □</td>
<td>Left in situ</td>
<td>Removed</td>
</tr>
</tbody>
</table>

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If CVC remains in situ for greater than 7 days – please use a continuation sheet to record daily maintenance.

**Variance recording:**

**Reason for removal**

- Exit site infection
- Bacteraemia
- Poor flow/dysfunction
- Leak/bleed
- End of treatment
- Other

If infection suspected, the catheter tip should be sent to Microbiology for culture & sensitivity.
Preventing infections when inserting and maintaining a CVC

Patient who needs a central vascular catheter (CVC)

When inserting a CVC

Ensure that:
- surgical scrub is performed immediately before donning maximal sterile barrier precautions (i.e., gloves and gown)
- maximal sterile barrier precautions are used, including headwear, mask, sterile gown, and sterile gloves for healthcare workers
- maximal sterile barrier precautions are used by applying a sterile body drape
- aseptic technique is maintained throughout insertion of CVCs
- a single-use 2% chlorhexidine in 70% isopropyl alcohol is used for skin preparation of the insertion site and allowed to dry, before CVC insertion*
- the subclavian site is used if possible or internal jugular vein (femoral site should be avoided whenever possible)
- a sterile transparent, semi-permeable dressing is used to cover the catheter site
- chlorhexidine-impregnated sponge dressing to cover the catheter site is considered

When maintaining an inserted CVC and accessing the insertion site and line

Ensure that:
- the need for the CVC in situ is reviewed and recorded today (on a daily basis)
- the CVC dressing is intact
- the CVC dressing has been changed in the last seven days
- a single-use 2% chlorhexidine gluconate in 70% isopropyl alcohol is used for cleaning the insertion site during dressing changes*
- hand hygiene is performed immediately before accessing the line/site (WHO Moment 2)
- a single-use antiseptic containing 70% isopropyl alcohol is used to clean the access hub prior to accessing – rub the access hub for at least 15 secs (“scrub the hub”)

Practice points

Documenting date and time of catheter insertion is an important step to achieve timely line removal.
The use of personal protective equipment (PPE) including gloves is important in all procedures where blood and body fluid risk exists.
The featured recommendation on hand hygiene does not detract from other times when hand hygiene is recommended and will be monitored against (namely the 5 Moments for Hand Hygiene).
The featured recommendations do not aim to cover emergency situations, which require clinical judgement for patient care actions.
For further information on the background to these recommendations and the literature reviews that informed these please visit http://www.hpa.scot.nhs.uk as well as referring to your local teams and policies.
Also see NHS Education for Scotland http://www.nes.scot.nhs.uk and Healthcare Improvement Scotland http://www.healthcareimprovementscotland.org/home.aspx for additional information on education and patient safety improvement.

*All medical and nursing staff involved in the use of all medical devices and medicinal products containing chlorhexidine should be aware of the risk of an anaphylactic reaction due to chlorhexidine allergy. The full details of the alert are available from the following web link: http://www.nhga.org.uk/Publications/Safetywarnings/MedicalDeviceAlerts/C0197918

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