Safe Removal of Femoral Arterial Sheaths Using a Digital Approach
Clinical Guideline

V4.0

December 2018
Summary
This guideline outlines the role of the registered nurse in removal of arterial femoral sheaths. This should only be carried out by staff who can demonstrate competency within this area of practice.
1. **Aim/Purpose of this Guideline**

1.1 To aid registered nurses in the safe removal of arterial femoral sheaths post cardiac angiography procedures.

1.2. **Data Protection Act 2018 (General Data Protection Regulation – GDPR) Legislation**

The Trust has a duty under the DPA18 to ensure that there is a valid legal basis to process personal and sensitive data. The legal basis for processing must be identified and documented before the processing begins. In many cases we may need consent; this must be explicit, informed and documented. We can’t rely on Opt out, it must be Opt in.

The DPA18 covers how the Trust obtains, hold, record, use and store all personal and special category (e.g. Health) information in a secure and confidential manner. This Act covers all data and information whether held electronically or on paper and extends to databases, videos and other automated media about living individuals including but not limited to Human Resources and payroll records, medical records, other manual files, microfilm/fiche, pathology results, images and other sensitive data.

DPA18 is applicable to all staff; this includes those working as contractors and providers of services.

For more information about your obligations under the DPA18 please see the ‘information use framework policy’, or contact the Information Governance Team rch-tr.infogov@nhs.net

2. **The Guidance**

2.1 **Equipment**

- Non Invasive BP monitor with oximeter (with pulse waveform display)
- Bed or trolley with tilt function
- Call bell
- Personal protective equipment (gloves, apron, mask, eye protection).
- Sterile gauze
- Suture cutter if required
- Sharps bin
- Analgesia if required
- Atropine injection if required
2.2 The Procedure

2.2.1 Explain the procedure to the patient. Rationale - To obtain verbal, informed consent. To reduce anxiety.

2.2.2 Ensure the patient is on a bed or trolley that is able to tilt so that the head is down. Rationale - To reverse the effects of vagal reaction in an emergency.

2.2.3 Ensure the patient is warm and comfortable.

2.2.4 Place the pulse oximeter probe on the patient and keep in situ throughout the procedure. Rationale - To monitor the patient's pulse and oxygen saturation.

2.2.5 Carry out blood pressure recording. Rationale - To obtain baseline observations. To ensure BP is within normal limits.

2.2.6 Use three senses technique to establish circulatory perfusion of the affected limb. Rationale - To identify potential factors, which may lead to complications.

2.2.7 Look: Compare colour to the non-affected limb. Are there changes/differences? Is there visible evidence of haematoma at arterial sheath insertion site?

2.2.8 Listen: What is the patient telling you? Is he/she experiencing chest pain or pain in the limb or abdomen?

2.2.9 Feel: Check pedal pulses dorsalis pedis and posteria tibia. Does the skin react to touch or sensitivity?

2.2.10 If you have any concerns about the above contact a more experienced colleague before proceeding.

2.2.11 Always make sure a colleague is aware you are about to remove a femoral sheath and is able to give immediate assistance if needed.

2.2.12 Wash hands as per Infection Control policy and put on a clean pair of gloves/apron. Rationale - To prevent infection at the entry site.

2.2.13 Consider the use of appropriate personal protective equipment, e.g. protective eye wear. Rationale – COSHH regulations.

2.2.14 If no Heparin has been administered during procedure, remove sheath immediately on return to ward.

2.2.15 If Heparin has been administered, wait two hours before removing sheath to allow the patients clotting time to return to baseline. Rationale - To reduce the risk of bleeding and the haematoma formation.

2.2.16 Administer prescribed analgesia if patient is in pain and/or atropine if symptoms dictate.
2.2.17 Remove outer dressings and wipe puncture site of any excess blood with sterile
gauze adhering to principles of asepsis. Rationale - To prevent complication of
sheath removal.

2.2.18 Place middle finger of left hand 1-2cm above the skin puncture site and feel for
the femoral pulse. Rationale - To identify the level of pressure required to
achieve haemostasis.

2.2.19 Locate pedal pulse with right hand.

2.2.20 Apply sufficient pressure in the groin to occlude the pedal pulse. Rationale - To
identify the level of pressure required to achieve haemostasis.

2.2.21 Explain to the patient that this level of pressure is needed throughout the
procedure. Rationale - To prepare patient for degree of pressure required
during sheath removal.

2.2.22 Release pressure slightly until the pedal pulse just returns. Slide the sheath out
of the artery using a slow steady motion. Rationale - To allow some blood flow
to limb. To minimise trauma to arteriotomy.

2.2.23 Apply sufficient pressure to prevent bleeding. This may require extra pressure
using the right hand over the left hand. It should not be necessary to occlude
the artery completely if you are pressing correctly. Rationale - To achieve
haemostasis.

2.2.24 Do not occlude the pulse totally for more than two minutes. Rationale - To
reduce the risk of tissue ischemia.

2.2.25 Continue to apply pressure over the puncture site for ten minutes. Rationale -
To allow haemostasis to take place.

2.2.26 Gradually release pressure over the next minute. Whilst observing the puncture
site. Rationale - To reduce the risk of bleeding and haematoma formation.

2.2.27 Once haemostasis has been achieved check pedal pulses. Rationale - To
ensure blood flow to distal limb.

2.2.28 Loosely cover puncture site with gauze. Rationale - To enable easy observation
of puncture site.

2.2.29 Inform the patient they have to lie flat in bed for 1.5 - 2 hours, then sit up in bed
for another 1.5 - 2 hours before mobilising. Advice patient to call immediately if
bleeding or swelling in groin occurs. Rationale - To ensure patients
understanding and compliance.

2.2.30 Record BP and pulse, observe the puncture site and check pedal pulses every
5 minutes for 15 minutes, then every 15 minutes for 1 hour, then every 30
minutes for 2 hours. Rationale - To continue monitoring of continued
haemostasis.

2.2.31 Document removal of arterial sheath in patients notes.
2.2.32 Inform operator without delay of all complications. Rationale - To ensure patients receives appropriate treatment.

2.2.33 Cardiac monitoring may be required until patient is allowed to mobilise and at the instruction of the operator if:

- Chest pain has occurred during procedure
- Sedation was administered during procedure
- Arrhythmias occurred during procedure.

2.3 Complications of Trans Femoral Approach

2.3.1 Vagal episode
Vaso vagal reactions are frequently (but not always) incited by pain in a tense, anxious patient and consist of hypotension, bradycardia and nausea. The patient will appear pale and clammy and will complain of feeling unwell. Vagal reactions will normally respond noticeably once treatment with atropine and fluids has been instigated.

2.3.2 Chest Pain
In patients are found to have abnormal coronary arteries at angiography, there is an increased risk of an ischaemic event or myocardial infarction. Therefore it is essential to obtain an ECG and call a doctor to assess the patient.

2.3.3 An ischaemic limb can occur when thrombus is present when there is a disruption of flow in the iliac vessels. It presents with cyanosis, pallor, loss of distal pulse and a cool/cold extremity associated with the onset of severe pain. Urgent surgical intervention is generally indicated, delay in treatment can lead to propagation of the thrombus into smaller distal branches of the femoral tree, making ultimate restoration of normal perfusion to the limb very difficult.

2.3.4 A haematoma is not life threatening but can be painful. If it is not diagnosed and effectively treated early on serious complications can develop. A haematoma occurs when blood gets trapped underneath the skin around the insertion site. This can happen for many reasons including an improper hold. If one compresses the insertion site too low, the artery will continue to leak. Blood will not be able to escape since the skin puncture is being occluded so it leaks into the tissues under the skin thereby causing a haematoma.

2.3.5 An AV Fistula (a communication with forms between the artery and vein) is thought to occur as a result of compression, if one attempts to remove the arterial and venous sheaths simultaneously. For this reason, it is recommended in this teaching pack that arterial and venous sheaths be removed separately. This approach may be effective at preventing the formation of an arterial/venous communication since each vessel seals off independently.
2.3.6 **Retroperitoneal Bleeding**: usually results from too high an arterial puncture. When the puncture is too high, it is difficult to apply pressure to the artery since the head of the femur cannot be used to compress against. The result is a large loss of blood into the peritoneal body cavity near the base of the spine. Inadequate compression can also result in a retroperitoneal bleed. This particular complication is usually related to the initial arterial puncture. If pulse waveform does not occur the tourniquet is loosened until waveform appears.

2.3.7 **Thrombus**: severe pain in arm or hand indicating thrombus. Immediately contact the procedure operator. A thrombolytic agent will be given to disperse the occlusion.

2.3.8 **Haemorrhage**: if at any point the puncture site starts bleeding digital pressure to the puncture site should be applied and contact the procedure operator.

### 3. Monitoring compliance and effectiveness

<table>
<thead>
<tr>
<th>Element to be monitored</th>
<th>Complications peri and post sheath removal procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>Cardiac Catheter Laboratories (CCL) Manager, Cardiology Ward Managers</td>
</tr>
<tr>
<td>Tool</td>
<td>Verbal reports received from colleagues, wound site observations, patient notes, patients or GP’s contacting department (elective day case procedures)</td>
</tr>
<tr>
<td>Frequency</td>
<td>Reports on ad hoc basis. Newly trained sheath removers to perform ten supervised femoral arterial sheath removals as part of training.</td>
</tr>
<tr>
<td>Reporting arrangements</td>
<td>Governance meetings</td>
</tr>
<tr>
<td>Acting on recommendations and Lead(s)</td>
<td>Recommendations from Lead CCL Consultant and CCL Manager</td>
</tr>
<tr>
<td>Change in practice and lessons to be shared</td>
<td>Change of practice will be implemented by CCL manager and CCL Lead Consultant. Sharing of lessons through governance meetings.</td>
</tr>
</tbody>
</table>

### 4. Equality and Diversity

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the ‘Equality, Inclusion & Human Rights Policy’ or the Equality and Diversity website.

**4.2. Equality Impact Assessment**

The Initial Equality Impact Assessment Screening Form is at Appendix 2.
Appendix 1. Governance Information

<table>
<thead>
<tr>
<th>Document Title</th>
<th>Safe Removal of Femoral Arterial Sheaths Using a Digital Approach Clinical Guideline V4.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Issued/Approved:</td>
<td>27/11/2018</td>
</tr>
<tr>
<td>Date Valid From:</td>
<td>December 2018</td>
</tr>
<tr>
<td>Date Valid To:</td>
<td>December 2021</td>
</tr>
<tr>
<td>Directorate / Department responsible (author/owner):</td>
<td>Tina Prestwood &amp; Ian Moyle</td>
</tr>
<tr>
<td>Contact details:</td>
<td>01872 252227 (TP) 07824 550718 (IM)</td>
</tr>
<tr>
<td>Brief summary of contents</td>
<td>This guideline outlines the role of the registered nurse in removal of arterial femoral sheaths. This should only be carried out by staff who can demonstrate competency within this area of practice.</td>
</tr>
<tr>
<td>Suggested Keywords:</td>
<td>Arterial sheath removal, femoral, angiography</td>
</tr>
<tr>
<td>Target Audience</td>
<td>RCHT CFT KCCG</td>
</tr>
<tr>
<td>Executive Director responsible for Policy:</td>
<td>Medical Director</td>
</tr>
<tr>
<td>Date revised:</td>
<td>October 2018</td>
</tr>
<tr>
<td>This document replaces (exact title of previous version):</td>
<td>Procedure for the safe removal of femoral arterial sheaths using a digital approach V3.0</td>
</tr>
<tr>
<td>Approval route (names of committees)/consultation:</td>
<td>Consultant Cardiologists, Matron for Acute Medicine and ED, CCU and CIU Ward Managers</td>
</tr>
<tr>
<td>Divisional Manager confirming approval processes</td>
<td>Robert Benton-Smith Charge Nurse Cardiac Catheter Laboratories</td>
</tr>
<tr>
<td>Name and Post Title of additional signatories</td>
<td>Not Required</td>
</tr>
<tr>
<td>Name and Signature of Divisional/Directorate Governance Lead confirming approval by specialty and divisional management meetings</td>
<td>{Original Copy Signed} Name: Karikalan Kandasamy</td>
</tr>
<tr>
<td>Signature of Executive Director giving approval</td>
<td>{Original Copy Signed}</td>
</tr>
<tr>
<td>Publication Location (refer to Policy on Policies – Approvals and Ratification):</td>
<td>Internet &amp; Intranet  ✓ Intranet Only</td>
</tr>
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</table>
**Document Library Folder/Sub Folder**: Clinical / Cardiology

**Links to key external standards**: None

**Related Documents**: Training: Trans femoral arterial sheath removal learning pack

**Training Need Identified?**: Yes. Successful completion of Self Directed Learning Package (Intranet, SDLP Femoral Arterial Sheath Removal), followed by a period of supervised practice and final clinical assessment.

### Version Control Table

<table>
<thead>
<tr>
<th>Date</th>
<th>Version No</th>
<th>Summary of Changes</th>
<th>Changes Made by (Name and Job Title)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 Feb 14</td>
<td>V1.0</td>
<td>Previous version history not known</td>
<td></td>
</tr>
<tr>
<td>13 Feb 14</td>
<td>V2.0</td>
<td>Reformat and rewrite.</td>
<td>Tina Prestwood Manager, Cardiac Catheter Laboratories</td>
</tr>
<tr>
<td>Feb 14</td>
<td>V3.0</td>
<td>Change of practice: Side arms on arterial sheaths are no longer aspirated prior to procedure to avoid accidental injections of air or blood clots.</td>
<td>Tina Prestwood Manager, Cardiac Catheter Laboratories</td>
</tr>
<tr>
<td>October 2018</td>
<td>V4.0</td>
<td>Names of applicable persons changed and updated</td>
<td>Robert Benton-Smith Charge Nurse Cardiac Catheter Labs</td>
</tr>
</tbody>
</table>

**All or part of this document can be released under the Freedom of Information Act 2000**

**This document is to be retained for 10 years from the date of expiry.**

**This document is only valid on the day of printing**

**Controlled Document**

This document has been created following the Royal Cornwall Hospitals NHS Trust Policy for the Development and Management of Knowledge, Procedural and Web Documents (The Policy on Policies). It should not be altered in any way without the express permission of the author or their Line Manager.
Appendix 2. Initial Equality Impact Assessment Form

This assessment will need to be completed in stages to allow for adequate consultation with the relevant groups.

| Name of Name of the strategy / policy / proposal / service function to be assessed |
| Procedure for the safe removal of femoral arterial sheaths using a digital approach |
| **Directorate and service area:** Acute Medicine and ED | **Is this a new or existing **Policy? **Existing policy** |
| **Name of individual completing assessment:** Tina Prestwood | **Telephone:** 01872 252227 |

1. **Policy Aim***
   - To guide trained staff in the safe removal of femoral arterial sheaths following cardiac angiography.

2. **Policy Objectives***
   - Femoral arterial sheath removal, digital method

3. **Policy – intended Outcomes***
   - Perform procedure safely.
   - Awareness of procedural complications

4. *How will you measure the outcome?*
   - See section 3 of the guidance.

5. **Who is intended to benefit from the policy?**
   - Cardiology patients and staff

6a **Who did you consult with**
   - Workforce: X
   - Patients: 
   - Local groups: 
   - External organisations: 
   - Other: 

   - Cardiology Matron Consultant Cardiologists Medical Director TREAD

b). Please identify the groups who have been consulted about this procedure.

| What was the outcome of the consultation? | Ratified |

7. **The Impact**
   Please complete the following table. If you are unsure/don’t know if there is a negative impact you need to repeat the consultation step.
Are there concerns that the policy could have differential impact on:

<table>
<thead>
<tr>
<th>Equality Strands:</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
<th>Rationale for Assessment / Existing Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sex (male, female, trans-gender / gender reassignment)</strong></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race / Ethnic communities / groups</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disability - Learning disability, physical impairment, sensory impairment, mental health conditions and some long term health conditions.</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion / other beliefs</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marriage and Civil partnership</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pregnancy and maternity</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual Orientation, Bisexual, Gay, heterosexual, Lesbian</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

You will need to continue to a full Equality Impact Assessment if the following have been highlighted:

- You have ticked “Yes” in any column above and
- No consultation or evidence of there being consultation- this excludes any policies which have been identified as not requiring consultation. or
- Major this relates to service redesign or development

8. Please indicate if a full equality analysis is recommended.  
   Yes ☑ No

9. If you are not recommending a Full Impact assessment please explain why.

Signature of policy developer / lead manager / director: Tina Prestwood & Ian Moyle

Date of completion and submission: 27/11/2018
Keep one copy and send a copy to the Human Rights, Equality and Inclusion Lead
c/o Royal Cornwall Hospitals NHS Trust, Human Resources Department, Knowledge Spa,
Truro, Cornwall, TR1 3HD

This EIA will not be uploaded to the Trust website without the signature of the
Human Rights, Equality & Inclusion Lead.

A summary of the results will be published on the Trust’s web site.

Signed __ Tina Prestwood & Ian Moyle
Date ____ 27/11/2018