Guidelines for the Management of Inadvertent Arterial Puncture and/or Cannulation

**Needle in the Artery (Pre-dilation)**
- Withdraw needle and guide wire if passed
- Firm (but not excessive) direct manual pressure for 15 minutes at assumed point of arterial wall puncture (i.e. caudal to skin puncture if jugular approach, medial if subclavian)
- Monitor for signs of expanding neck haematoma - if present arrange CT angiogram to evaluate site of arterial injury
- If CT angiogram demonstrates arterial trauma with active bleed, inform on-call vascular and interventional radiology consultants

**Catheter in the Artery (Post-dilation)**
- Do not withdraw or use catheter (risk of major haemorrhage at non-compressible / intra-thoracic site)
- Inform on-call vascular and interventional radiology consultants
- Commence heparin IV aiming for APTT ratio 2.0-2.5 with initial 5000units heparin bolus via separate point of access (risk of stroke due to foreign body in cerebral blood supply)
- Arrange CT angiogram to evaluate Circle of Willis to descending thoracic

**Anticipate theatre or interventional radiology procedure (i.e. prepare for transfer and ensure adequate group and save available)**

Date: May 2017  Revision Date: May 2019  Authors: ME/FB
1. INTRODUCTION

Inadvertent arterial puncture with a small needle puncture appears to be harmless in the vast majority of cases and most of these small needle arterial punctures are recognised during the procedure. However, failure to recognise an arterial puncture may result in subsequent placement of a large-bore catheter (4-7 Fr) into an artery.

The incidence of inadvertent arterial cannulation ranges from 0.1% to 1.0% of attempted CVC placements in reported series.

Inadvertent arterial placement of a large-bore catheter may result in haemorrhage, pseudoaneurysm, stroke, or death.

2. PROCESS

<table>
<thead>
<tr>
<th>Recommendation (Action)</th>
<th>Justification (Rationale)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not simply remove the catheter and press</td>
<td>Several case series have shown a “pull-and-pressure” approach is associated with a high incidence of serious complications (~50%), including death. Open surgical or endovascular repair aims to reduce this risk.</td>
</tr>
<tr>
<td>Ultrasound guidance reduces (but does not completely prevent) the risk of arterial cannulation</td>
<td>Arterial puncture may occur despite the use of ultrasound</td>
</tr>
<tr>
<td>The patient needs to be anti-coagulated</td>
<td>Prolonged arterial cannulation can result in thrombus formation around the intra-arterial foreign body and result in stroke.</td>
</tr>
<tr>
<td>Do not use the line for anticoagulation</td>
<td>The risks of embolus are high and the line should not be used as risk to the patient is the clot is in the vessel not the line</td>
</tr>
<tr>
<td>If it is a femoral line there may be a role for pull-and-pressure</td>
<td>This should only be done following consultation with the vascular team as false aneurysms or arteriovenous fistulae can occur as a late consequence of such a technique. Close clinical observation and duple surveillance is mandatory.</td>
</tr>
</tbody>
</table>

3. REFERENCES

