Donor Haemovigilance

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The contents of this document are believed to be current. Please continue to refer to the websites for in-date versions.

Management of accidental arterial puncture related to blood donation

This framework has been created by the Accidental Arterial Puncture Collaboration, a subgroup of the Standing Advisory Committee on Care and Selection of Donors (SACCSD). The group comprises of representatives of the four UK Blood Transfusion and Tissue Transplantation Services, the Irish Blood Transfusion Service and Serious Hazards of Transfusion (SHOT). Participants have extensive experience of post-donation care of donors.

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Abbreviations

AAP	Accidental arterial puncture
ACF	Antecubital fossa
ADL	Activities of daily living
A&E	Accident and Emergency
DAE	Donor adverse event
GP	General practitioner
IBTS	Irish Blood Transfusion Service
NHBST	National Health Service Blood and Transplant
NIBTS	Northern Ireland Blood Transfusion Service
NSAIDs	Nonsteroidal anti-inflammatory drugs
SACCSD	Standing Advisory Committee on Care and Selection of Donors
SHOT	Serious Hazards of Transfusion
SNBTS	Scottish National Blood Transfusion Service
WBS	Welsh Blood Service

1. Introduction

1.1. Scope

The focus of this collaboration is to provide an overview of best practice in the management of accidental arterial puncture (AAP) during the process of donating blood products.

The report covers two distinct areas, that is (a) identification and management of AAP at session and (b) identification and management of AAP once a donor has left session. In both instances, guidance on systematic and thorough assessment by the healthcare professional, self-care advice to the donor, advice on onward referral and suggested follow up by blood transfusion services are provided.

These guidelines do not cover measures to prevent AAP. For guidelines on this area, please refer to *'Good Venepuncture Practice'*, available from the Donor Haemovigilance Hub on the JPAC website.

1.2. Guideline development

The guidelines were compiled by the Accidental Arterial Puncture Collaboration, a subgroup of the Standing Advisory Committee on Care and Selection of Donors (SACCSD).

The aim of these guidelines is to support good practice within blood transfusion services when managing AAP incidents in blood donors. The literature was extensively reviewed and the existing wealth of knowledge on current practice and experience across the UK and Irish Blood Transfusion Services was captured, culminating in this informative and supportive document. We sought external expert advice from sources in Vascular Surgery (Royal College Pathologists).

These guidelines were approved by the JPAC Executive Working Group on 9 October 2025.

1.3. Why are these guidelines required?

Arm complications account for 30% of all whole blood donation adverse events. Of these, accidental arterial punctures are rare adverse events and tend to do very well if recognised and managed appropriately.[1] The literature suggests an incident rate of 1 in 9000 to 1 in 100,000.[2,3]

Early recognition at session, treatment and appropriate advice are paramount to avert very rare, albeit serious complications such as pseudoaneurysm formation, arteriovenous fistula formation and compartment syndrome.[3]

These guidelines have been created to support healthcare professionals (nurses and doctors) in the assessment and management of donors experiencing signs and symptoms suggestive of AAP. Furthermore, these guidelines aim to ensure a consistent approach across UK and Irish Blood Transfusion and Tissue Transplantation Services.

1.4. Review of these guidelines

These guidelines will be regularly reviewed by SACCSD (on behalf of JPAC). This is to ensure that any changes in the ISBT/international guidelines, as well as any feedback from the four UK Blood Transfusion Services, relating to donor haemovigilance are captured and incorporated in this guidance to help promote donor safety.

2. Key recommendations

- If in doubt, treat as an AAP event.
- Accurate and comprehensive documentation of the event is essential.
- Once AAP is identified, apply immediate pressure for 10 minutes followed by an effective pressure bandage. AAP should be managed by trained staff under direct supervision of the clinical lead on session.
- Review by the clinical lead at session prior to discharge is recommended.
- Provide AAP information leaflet at the earliest opportunity, at session or by email/electronically.
- Avoid strenuous activity with the affected arm for at least 24 hours.
- Consider whether AAP was missed at session. If in doubt, treat as an AAP and provide appropriate advice and AAP information leaflet.
- Arrange follow-up call for the next working day.
- The affected arm must not be used in future donations.
- Be conscious that processing/manufacturing might inform medical staff about donations suspicious of AAP.

3. Accidental arterial puncture

3.1. Mechanism of injury

AAP occurs when the brachial artery or one of its subsidiaries is inadvertently punctured during blood donation venepuncture. The brachial artery runs through the medial part (little finger side) of the antecubital fossa (ACF). It often passes just behind the median cubital vein, one of the superficial veins in the front part of the ACF. Although AAP can occur directly to the artery, it can also be caused by the needle being passed through the back wall of the vein during a failed venepuncture procedure. Staff should always check for the position of the brachial artery by locating a pulse before inserting the needle. They should

also avoid advancing the needle too deeply, either at the time of donation or if adjusting the needle due to poor flow.

Once AAP has occurred, the high pressure within the arterial system can delay the formation of an effective blood clot to plug the gap in the artery. Affected donors are at increased risk of a donor adverse event related to bleeding, such as bruising, haematoma or rebleeding (delayed bleeding).

3.2. Contributing factors

AAP is already a rare event and there is limited evidence for clear contributing factors.

- In one study, venepuncturist inexperience was associated with higher rates of AAP.[4]
- Difficult venepuncture may increase the risk of AAP, particularly if needle adjustment includes advancing it further into the ACF.
- The anatomy of the ACF is highly variable. Failure to carry out a pulse check may place an individual with an anomalous brachial artery distribution at greater risk of AAP, even if the needle is not being placed on the medial side of the ACF.

3.3. Clinical impact of AAP

Published data suggests about one third of affected donors experience haematoma after AAP.[4] Bruising may be extensive and cause significant pain and loss of function for the donor. There is also a risk of delayed bleeding (rebleeding). In most cases, the donor will make a full recovery, although it may take several weeks for bruising to settle fully. The impact of severe bruising on donor wellbeing should not be underestimated.

3.4. Other complications of AAP

Rarely, bruising related to AAP may lead to the development of secondary nerve damage. Neurological symptoms tend to persist even after any bruising has resolved – refer to *'Post-donation management of blood donors with nerve injury related to donation'*, available on the JPAC website, for further information and guidance.

Vascular complications arising after AAP are very rare (less than 1 in 1 million reported)[5,6] but should be considered in any donor presenting with atypical arm symptoms, even if AAP was not suspected at the time of venepuncture:

- **Brachial pseudoaneurysm** refers to the formation of an organised haematoma outside the artery wall but still in connection with it. It usually presents as a painless lump which may or may not be pulsatile. The lump may vary in size and may cause pressure effects (e.g. difficulty in bending the arm, nerve irritation).

- **Arteriovenous fistula** occurs when a connection is formed between the brachial artery and an overlying vein. Signs and symptoms include prominent veins, abnormal pulsation in the arm, presence of a bruit or palpable thrill near the venepuncture site and/or a pulsatile mass in the arm.

Vascular complications require urgent assessment by a specialist in vascular surgery. In many instances surgical repair will be required.

3.5. Identification at session

Suspect AAP if one or more of the following is observed:

- There is very rapid flow of blood into the collection bag, usually with a collection time ≤3 minutes.
- Blood flow appears pulsatile or spurting during donation or on removal of needle.
- The needle or tubing is pulsating or falls out of the donor's arm.
- Blood appears bright red (oxygenated) and/or frothy in the collection bag.

Other features of AAP presentations may include:

- Difficult venepuncture and/or manipulation of the needle.
- Sharp pain at the venepuncture site. Be alert if the donor reports that the pain is more severe or different in character from their usual experience of venepuncture.
- Rapid development of a haematoma after the needle is removed, even if external bleeding has stopped.
- Continued or delayed bleeding after routine pressure has been applied to the venepuncture site.
- A vasovagal reaction due to painful venepuncture or rapid blood loss, especially if this occurs in a regular donor.

3.6. Identification once donor has left session

AAP may be identified after the session if the laboratory reports unusually red or frothy blood in the blood bag or if the donor contacts the blood bank with venepuncture-related complications. Usually, it is difficult to confirm the diagnosis. Review of the donor's record from their session attendance plays an important role in assessing the likelihood of AAP having occurred.

Post-donation (once donor has left the session) presentations of AAP could include:

Bruising and haematoma

Consider AAP if extensive bruising is present and spreading away from the venepuncture site. The presence of a lump or swelling suggestive of haematoma which has developed after the session may also raise the suspicion of an AAP. Donors may report significant pain, stiffness of the arm and loss of function. It should be noted that without associated features, severe bruising or haematoma formation alone does not confirm a diagnosis of AAP.

Re-bleeding

Bleeding which restarts after the donation may be due to dislodgment of the clot from a punctured artery. This may be more likely if AAP has not been identified and managed with appropriate pressure application at session.

Pressure symptoms

Rapid arterial bleeding into the closed anatomical space of the ACF may cause pressure on nerves and other structures. Donors may report a very painful tense arm with pain being disproportionate to the visible signs. They may also experience neurological pain and paraesthesia. Urgent action is required if a donor reports symptoms suggestive of compartment syndrome (severe and increasing pain, change in arm temperature and colour, loss of hand function, diminished pulses).

Vascular complications

Very rarely, a diagnosis of AAP will only be made if the donor develops a vascular complication such as brachial pseudoaneurysm or arteriovenous fistula.

4. Management of accidental arterial puncture

The majority of arterial bleeds are identified at the donation session, either during donation or soon after. However, a minority may present after leaving a donation session with extensive bruising and haematoma. Very rarely, bright red blood in a red cell pack may be identified during processing and further assessment of the donor could reveal a potential arterial bleed. Late presentation is usually seen with partial arterial puncture.

All blood transfusion services must have mechanisms in place to ensure donors with a suspected arterial bleed reported post donation are promptly reviewed and provided with appropriate clinical advice, including out-of-hours support.

Designated Clinical Support Officers (DCSOs) and other clinicians managing donor adverse events must ensure that a complete record is made of any consultations with donors, whether conducted by telephone, electronically or face-to-face.

4.1. Management at session

- Stop donation, remove the needle immediately and apply pressure.
- Apply pressure for 10 minutes.[7] If bleeding continues, maintain pressure for another 10 minutes. If bleeding does not stop, continue to apply pressure and refer to A&E as an emergency, providing an information leaflet to the donor, for the receiving healthcare professional.
- If bleeding has settled, observe for a cold hand, loss of colour, loss of radial pulse, and bleeding. If any of these presents, urgent medical review is required. The donor should be referred to A&E as an emergency.

- Apply a pressure bandage which should be kept on for 4-6 hours.[4,7]
- Observe the donor at the session for 20 minutes.
- Apologise, provide a full explanation of what has happened, address any queries the donor may have.
- Provide the donor with information leaflet and blood transfusion service contact details.
- Ensure discharge by the most senior staff, who should observe the donation site and arm before discharge.[8]
- Report the adverse event according to service protocols.
- Arrange for a follow-up call on the next working day by a doctor or donor care nurse.

Note If the full donation was collected, it can be treated as usable.

4.2. Management once donor has left session

- Assess for any complications related to haematoma or bleeding.
- Advise on the management of haematoma, bruising and pain.
- Ask the donor for further details on the donation, including any issues with the venepuncture, rapid filling of the blood bag or bright red blood.
- Advise the donor when to seek medical advice and explain possible rare late complications, including when to consult their GP, and ask the donor to keep the blood transfusion service updated.
- Provide information on future donations.
- Provide an information leaflet to the donor and follow up with a call.
- Report the Donor Adverse Event (DAE), including details for the performance of venepuncture. Record the arm used for donation.

4.3. Management if bright red blood is reported to have been detected during donation processing

- Review the donor's records for bleeding time and any records of venepuncture or DAEs.
- Contact the donor and explain the finding of bright red blood.
- Assess the donor for any possible arterial bleed.
- Check for any excessive bruising or haematoma.

- Ask the donor for further details on donation, including any difficult venepuncture, rapid blood bag filling or bright red blood.
- If an arterial bleed is suspected, advise the donor on managing bruising, haematoma, and pain. Explain possible late complications and when to seek medical advice.
- Send an information leaflet to the donor.
- Advise the donor to contact the blood transfusion service if any symptoms develop, specifying which symptoms to watch out for.

4.4. Advice to the donor

- Provide full explanation of the incident and address any donor queries.
- **Pressure bandage care:** Keep pressure bandage on for four to six hours[4,8] unless it causes discomfort.
- **Use of affected arm:** Avoid strenuous movements of affected arm for at least 24 hours. Gentle, normal movement is encouraged.
- **Management of haematoma and bruise:**
    - Donor may experience a bruise following this complication, which may look dramatic and could spread before fading. This is normal.
    - The bruise will gradually disappear, possibly taking more than a week. It may change from bluish-purple to yellow before finally fading. Symptoms should improve in about a week.
    - Treat the bruise with RICE: Rest, Ice, Compression and Elevation. After 36 hours, contrast bathing may help to reduce swelling. This requires applying a warm and cold cloth on the affected area alternatively for 10 minutes, ending with a warm cloth. Cloths should be in comfortable temperature – tap water temperature for cold cloth and temperature similar to a warm bath for warm cloth.
- **Pain management:** If the donor requires pain relief, advise them to take paracetamol (as per the manufacturer's instructions) but avoid aspirin and NSAIDS for the first 24 hours.
- **When to seek medical care:** If the donor experiences any of the following, they should raise the arm, apply pressure, and attend A&E with the information leaflet/ referral letter. On their way to the hospital, they should keep the arm raised and apply firm pressure over the site of needle entry.
    - Bleeding restarting
    - Large or increasing swelling
    - Rapidly developing large bruise
    - Numbness or tingling in the arm, hand and/or fingers
    - Severe or worsening pain
    - Coldness or paleness in the lower arm or hand

- **Rare complications:** Rare complications such as dilated veins, a thrill (vibration), or a pulsatile mass in the affected arm should be evaluated urgently. The donor should also inform the blood transfusion service.
- **Future donations:** The affected arm should not be used for future donations. There should be a mechanism to ensure that session staff are informed about the previous incident of arterial puncture.
- Provide contact details of the blood transfusion service and inform the donor to expect a follow-up call the next working day.

4.5. Advice to GP/Healthcare professionals

- Donor identification details: Name, Age, Donor Number
- Place and time of incident
- Affected arm (right/left)
- History (e.g. use of a 16G needle, suspected arterial bleed)
- Possible complications and their typical presentation time frame:
    - Haematoma and extensive bruising (soon after arterial puncture or within a few days)
    - Compartment syndrome (typically becomes apparent within 6 to 12 hours after an injury)
    - Pseudoaneurysm (delayed presentation after weeks; there was a reported case two months after blood donation[9])
    - AV fistula (delayed presentation after weeks)
- Include the blood transfusion service contact details for further inquiries.

5. Miscellaneous

5.1. Follow-up care

A straightforward Accidental Arterial Puncture (AAP) detected during venepuncture or collection may not require prolonged follow up beyond immediate management to control bleeding, minimise bruising and manage vasovagal reactions with appropriate self-care and worsening advice.[10]

Contact the next working day will help to identify if the donor is experiencing any symptoms suggestive of associated or emerging adverse events not already identified that might indicate the need for more prolonged further follow up.

Occasionally AAP may be identified after collection e.g. appearance of the blood by laboratory staff. In this situation, contact with the donor as soon as possible after identification will allow assessment of bleeding risks and the delivery of self-care and worsening advice.

The possibility of a missed AAP should also be considered when following up a donor reporting severe bruising, arm swelling or vascular complications.

5.1.1. Reasons for follow-up care[10]

- As a courtesy to the donor who has experienced an adverse event as a result of donation. AAP could be a potentially frightening experience for any donor who should be offered an explanation, reassurance and support.
- To track the donor's recovery or worsening of symptoms and to identify early symptoms which require urgent onward referral e.g. compartment syndrome due to large volume bleeding.
- To detect symptoms suggestive of an adverse event complication of AAP which might require longer follow up, support or referral e.g. nerve injury, vascular complications such as brachial artery pseudoaneurysm or arteriovenous fistula.
- To provide ongoing general support and information to donor, including self-care information.
- To ensure any courses of action or treatment recommended have been followed through (e.g. referral to A&E or GP).
- To gather information about AAP including associated complications, incidence, demographics. Collection of robust national data on AAP post donation will support the donor consent process and effective benchmarking between blood transfusion services.
- To identify longer-term serious injuries such as those reportable to SHOT. These may be missed if follow-up is discontinued.

5.1.2. Frequency of follow-up calls

All donors with a confirmed or suspected AAP should be followed up at least once by blood transfusion services. Subsequent frequency of follow-up calls will be dependent on the following factors:

- Severity of potential complications of AAP.
- Potential for complications to emerge later. A large haematoma may have to reduce in size before a persistent nerve injury or a vascular complication such as pseudoaneurysm or arteriovenous fistula becomes apparent.
- Persistence of symptoms and impact on the donor's Activities of Daily Living (ADL).
- Donor's anxiety levels or expectation.

- Timing of updates after the donor has been clinically assessed or investigated by the NHS (Primary or Secondary Care, Imaging).
- Consider whether further follow-up calls to the donor are required if their symptoms have not settled. All donors should be made aware of how to contact the blood transfusion service if they experience a worsening of symptoms or have any ongoing concerns about an adverse event.

5.1.3. Content of follow-up calls

This will change as time passes with calls in early days focusing on physical symptoms, red flags, worsening and self-care advice. Later calls may include progress of any clinical assessments, investigations, treatment, or interventions with outside NHS agencies.

Specific content will vary but general themes include:

- Ongoing symptoms, improvement, worsening or change; impact of symptoms on the donor
- Involvement of other healthcare professionals
- Outcome of reviews, investigations or treatment
- General support and reinforcement of self-care advice as appropriate
- Recommendation for further referral
- Discussion about future donation. This will depend on the severity of injury, history of previous adverse events and the donor's preference. If the donor is fully recovered and wishes to donate again, they may do so but only from the opposite unaffected arm. It may be necessary to defer the donor from future donation if the donor has longer term complications or felt to be at risk of future similar adverse events.
- Keeping donor updated with any Duty of Candour proceedings
- Agreed date for future contact

5.2. Duty of Candour

Every health and care professional must be open and honest with patients and people in their care when something that goes wrong with their treatment or care causes, or has the potential to cause, harm or distress.[11] It is important for healthcare professionals to be familiar with the Duty of Candour requirements in the respective jurisdiction of practice.

This ensures transparency, accountability, and continuous improvement in donor and patient safety.

5.3. Documentation

5.3.1. Initial session

When making an assessment it is important to capture the following:

- Donation date/donor ID number/date incident reported/donor details
- Type of donation (whole blood/apheresis)
- Which arm is affected? Dominant or non-dominant?
- Venepuncturist (grade and experience)
- Where was the needle inserted (medial, mid or lateral antecubital fossa)?
- Checklist of symptoms (observed and donor's own description of symptoms):
    1. Bright red colour
    2. Fast or pulsating flow
    3. Severe pain
    4. Rapid haematoma formation
    5. Light headedness
    6. When symptoms started: with donation (at needle insertion, during donation or at needle withdrawal) or after donation.
- What actions were taken at session?
    1. Donation stopped or not (at how many minutes?)
    2. Firm digital pressure applied to VP site for 10 minutes
    3. Pressure bandage applied
    4. Distal and radial pulses checked
- Information leaflet given? (including what donor should look for to recognise development of complications)
- Outside medical care required?

5.3.2. Follow-up contact

- When follow-up contact was made and by whom
- Checklist of symptoms / ask about development of complications:
    1. Has arm become painful?
    2. Development of pins & needles, numbness?
    3. Has arm become cold or blue?
    4. Has arm become red and swollen?
- How long have the symptoms persisted?
- Was any outside medical care required?
- Date of agreed upon next contact, if applicable.

5.4. Good venepuncture practice

Refer to *'Good Venepuncture Practice'* available from the Donor Haemovigilance Hub on the JPAC website.

5.5. Key Performance Indicators and Key Assurance Indicators

To promote clinical excellence, it is recommended that blood transfusion services implement and monitor a system of Key Performance Indicators (KPIs) and Key Assurance Indicators (KAIs) for AAPs. KPIs may include total number of annual AAPs benchmarked against internationally acceptable incident rates. KAIs should focus on assurances that all AAPs are followed up appropriately during the post-donation period with appropriate clinical care and guidance till full recovery.

6. References

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