Donor Haemovigilance

June 2025

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Post-donation management of blood donors with nerve injury related to blood donation

This framework has been created by the Nerve Injury Short Life Working Group, a sub-group of the Standing Advisory Committee on the Care and Selection of Donors (SACCSD). Participants included representatives from the four UK Blood Transfusion and Tissue Transplantation Services and the Irish Blood Transfusion Service. All participants have direct experience of post-donation care.

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Update information

Version	Date of publication	Changes
2.0	13 June 2025	Section 1.3: Rate of SAED updated to 2023 data Section 4.6: Terminology changed from 'graded' to 'assigned as' Section 5.2: Reduction in follow-up period from 12 to 6 months. Additional provision if services are unable to follow up affected donors at 6 months. Section 5.3: Reduction in follow-up period from 12 to 6 months Section 5.4: Addition of a new section to refer to new JPAC guidelines for assessment of Donor Adverse Events Appendix: Addition of information re Median Nerve damage to Table 1
1.0	November 2020	First published

Abbreviations

ADL	Activities of daily living
CRPS	Chronic regional pain syndrome
DCSO	Designated Clinical Support Officer
NISLWG	Nerve Injury Short Life Working Group
NSAID	Non-steroidal anti-inflammatory drug
SACCSD	Standing Advisory Committee for the Care and Selection of Donors
SAED	Serious adverse event of donation
SHOT	Serious Hazards of Transfusion (Haemovigilance Organisation)
TENS	Transcutaneous electrical nerve stimulation

1. Introduction

1.1. Scope

These guidelines apply to management of donors who have symptoms suggestive of nerve injury after donation. They provide instructions for initial telephone assessment, self-care advice, onward referral if required, and follow up by healthcare professionals within transfusion services.

They do not cover measures to prevent nerve injury at venepuncture, session management of painful venepuncture or further treatment of nerve injury.

1.2. Guideline development

These guidelines were prepared using available evidence and expert opinion to support good practice in the management of post-donation nerve injury by transfusion services. Sources included literature review, consultation with experts in the fields of neurology and neurophysiology and review of existing practice in the UK and Irish transfusion services.

The guidelines were written by the Nerve Injury Short Life Working Group, a subgroup of the Standing Advisory Committee on Care and Selection of Donors (SACCSD). They were first approved by JPAC for use by the UK Blood Services on 05 November 2020.

1.3. Why are these guidelines required?

Nerve injury resulting in pain, sensory loss, paraesthesia and loss of upper limb function is a rare but potentially serious complication of blood donation. Published evidence suggests that 30-70 donors per 100,000 donations will develop a nerve injury [1, 2]. Of these, around 4-5 per 100,000 may go on to develop long term symptoms. In the UK, problems related to needle insertion persisting for more than a year or requiring hospitalisation/intervention have been the most commonly reported Serious Adverse Event of Donation (1 per 53,000 donations in 2023 [3]). Early assessment and treatment may reduce the risk of long-term problems developing.

Post-session donor care is undertaken by designated medical or nursing staff within each transfusion service (Designated Clinical Support Officer: DCSO). These guidelines have been created to support DCSOs in the assessment and management of donors with arm symptoms suggestive of nerve injury post donation, and to ensure consistency of approach across UK and Irish transfusion services.

1.4. Review of these guidelines

These guidelines will be regularly reviewed by SACCSD to align with any changes in the ISBT/international guidelines relating to donor haemovigilance and to incorporate any changes following implementation. Feedback from the four UK Blood Services will enable timely responses and improvements to these guidelines and help to promote donor safety. The current version of these guidelines was approved by the JPAC Executive Working Group (EWG) on 23 April 2025.

2. Key recommendations

2.1. Donor sessions

1. Increase awareness and education for all donor-facing staff regarding potential nerve injury after blood donation.

2. Inform all donors at session when and how to report post-donation arm symptoms (other than mild bruising) to the relevant transfusion service.

2.2. Post-donation care

These recommendations are for DCSO staff managing donors after the donor session:

1. Ensure appropriate self-care advice is given to all donors with nerve injury, including provision of written information if required.

2. Ensure urgent referral of donors with severe symptoms to an appropriate clinical service (e.g. A&E, emergency GP).

3. Consider GP referral for donors with moderate or persistent symptoms. Early intervention may reduce the risk of long-term complications.

4. Follow up all donors reporting arm symptoms until resolved. Donors with persistent symptoms should be followed up until at least 12 months post-donation.

3. Venepuncture-related nerve injury

3.1. Causes

Direct nerve injury

- Direct trauma to the nerve by venepuncture
- Immediate symptoms of sharp pain, 'electric shock' and paraesthesia
- Occurs at needle insertion, during donation or at needle withdrawal

Indirect nerve injury or irritation

- Caused by compression, stretching or inflammation of the nerve
- Symptoms develop more gradually in hours/days post-donation
- Usually secondary to haematoma formation but may also be caused by inflammation or infection associated with venepuncture

3.2. Symptoms

Nerve injury characteristically presents as pain associated with sensory symptoms (paraesthesia) that map onto a specific peripheral nerve territory. Motor symptoms may also occur.

Local symptoms

- Pain, usually described by the donor as sharp, burning, shooting or electrical. Pain often radiates into the lower arm, hands and fingers and occasionally into the upper arm. Pain may be provoked by specific movements or occur spontaneously
- Paraesthesia: tingling, numbness, altered sensation or a 'pins and needles' feeling
- Allodynia: evoked pain or discomfort caused by events that are not usually painful, e.g. stroking the skin, cold temperatures
- Weakness (of the fingers, wrist, grip strength, elbow movements)
- Arm feels abnormal, e.g. donor describes unpleasant feeling or heaviness

General symptoms

- Difficulty sleeping or resting
- Activities of Daily Living (ADL) affected. Donors may report difficulty in routine activities such as lifting, dressing, driving etc. In severe cases donors may be unable to continue their normal work until resolved
- Emotional distress secondary to chronic pain and reduced function

3.3. Prognosis

Recovery from nerve injury will depend on the extent and severity of nerve damage. Minor nerve irritation will usually resolve within days to weeks [1]. Note that neurological symptoms caused by haematoma formation may persist after the bruise itself has resolved.

More significant disruption to the nerve may take weeks to months to resolve fully. In a small number of cases symptoms persist and may become permanent. In the most severe cases Chronic Regional Pain Syndrome (CRPS, see Appendix) can develop, although this is very rare [1, 2, 4].

For donors with significant nerve injury, prognosis may be improved by early intervention, particularly provision of adequate pain relief [4, 5, 6].

3.4. Assigning severity to nerve injury symptoms

For the purposes of these guidelines, nerve injuries are assigned severity as below. Note that severity is based on the donor's description of their symptoms rather than an objective assessment of nerve damage.

Mild

- Mild pain or discomfort which is neurological in nature
- Mild or transient paraesthesia
- Little impact on donor, not affecting function or ADL
- Does not require regular analgesia

Moderate

- Symptoms or pain and/or paraesthesia are more prominent and persistent
- Low level function loss, limited effect on ADL. Generally able to continue with work etc.
- Requires regular analgesia
- May be woken in the night due to these symptoms (although does not prevent sleep)
- Able to maintain function with discomfort

Severe

- Severe pain and/or paraesthesia
- Significant loss of function, ability to perform ADL impaired
- Pain not well-controlled with regular analgesia
- Significant sleep interruption / symptoms make it very difficult to sleep
- Psychological distress due to ongoing symptoms
- May have already sought urgent medical advice/care
- May have had to take time off work

4. Management of post-donation nerve injury

4.1. Reporting to DCSO

Potential nerve injury is reported to the DCSO in the post donation period either directly from session or through post-donation information from the donor.

All transfusion services must have mechanisms in place to ensure donors reporting arm complications post donation are reviewed and given appropriate clinical advice promptly, including out of hours.

DCSOs and other clinicians who are managing donor adverse events, including arm complications, must ensure that a full record is made of any consultations with donors, whether these are carried out by telephone, digitally or face-to-face.

4.2. DCSO assessment of arm symptoms

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

- Which arm is affected? Dominant or non-dominant?
- Where was the needle inserted (medial, mid or lateral antecubital fossa)?
- Donor's own description of symptoms
- When did symptoms start?
    - With donation (at needle insertion, during donation or at needle withdrawal)?
    - After donation?
- What actions were taken at session? Was the donation stopped?
- How long have the symptoms persisted?
- Checklist of symptoms:
    - Pain or Tenderness:
        - Where is it and where does it radiate to?
        - What is it like?
        - How severe is it?
        - Is it constant or intermittent?
        - What makes it worse or better?
        - Have you taken any analgesia? Did it help?
    - Paraesthesia:
        - Do you have any altered sensation, numbness, tingling or hypersensitivity affecting the hand or arm?
        - If yes, where? (Include details of which fingers (front/back) or parts of hand and forearm are affected)
    - Motor symptoms:
        - Do you have any weakness in your hand or arm, including grip strength?
        - Can you move your arm normally?
        - If no, is it because of weakness or due to pain on movement?

- Bruising:
  - Extent, location, colour, history of development?
  - Any associated symptoms?
- Swelling – localised or general swelling of arm. If localised, is it pulsatile?
- Any redness / inflammation / tracking marks on arm?
- Circulation – colour and temperature of forearm/hand; radial pulse present?
- Systemic symptoms – fever, malaise, pain elsewhere, breathlessness

4.3. Diagnosis of nerve injury

Radiating pain associated with sensory symptoms is highly suggestive of nerve injury. Immediate symptoms at venepuncture, particularly 'electric shock' type pain radiating into the forearm and hand, imply direct nerve injury. Symptoms developing in the hours and days after donation imply indirect injury, usually caused by nerve compression or stretching due to haematoma or soft tissue injury.

Further information about individual nerve injuries is included as an Appendix. This is only a guide, and a specific diagnosis should not be made without expert advice.

DCSO management of nerve injury (either direct or indirect) is the same whatever nerve is affected. Assess severity as mild, moderate or severe (section 3.4) and manage as per sections 4.5-4.7 below.

4.4. Non-neurological causes of post-donation arm symptoms

Care must be taken to exclude non-neurological causes of post-donation arm pain before a diagnosis or nerve injury is made. These include:

Haematoma / bruising

A haematoma is defined as a collection of extravascular blood. It may initially present as localised swelling at or near the venepuncture site. Depending on the extent and position of the haematoma, bruising may develop immediately or over several days as the haematoma resolves. In the absence of nerve irritation, haematomas cause pain and tenderness over the bruised areas. They may also restrict movement at the elbow due to discomfort.

Tendon injury

Tendon injury presents as localised tenderness near the venepuncture site and pain which radiates into the upper arm. It is usually accompanied by pain on movement and may cause weakness to the affected arm. It is not usually accompanied by sensory abnormalities.

Local infection or inflammation (Cellulitis, Thrombophlebitis)

Cellulitis and thrombophlebitis present with symptoms of warmth, tenderness, local pain, redness and swelling at the site of phlebotomy. The site and the vein may feel tender, firm, and warm to the touch. Fever may be present.

Vascular Complications

Vascular complications of venepuncture are rare but always require medical intervention. Donors with unusual symptoms should be advised to seek urgent review by an appropriate clinician. This will usually be attendance at A&E or an emergency GP appointment depending on the severity and timing of the symptoms.

1. **Compartment Syndrome** occurs when a large volume bleed occurs into the forearm., resulting in compression and compromise of the blood supply, leading in turn to hand ischaemia. It presents with severe pain, pallor of the affected hand, paraesthesia, faint or absent pulse and paralysis of the limb. Emergency medical treatment should be sought via a 999 call.

2. **Brachial Artery Pseudoaneurysm** usually presents as a pulsating mass in the arm, which may be accompanied by the development of pain and paraesthesia. Donors may report that symptoms were preceded by a large hematoma following arterial puncture.

3. **Arteriovenous Fistula** can occur if the venepuncture needle goes through the back of the vein into the brachial artery. Donors may report an unusual pulse or 'buzzing' sensation near to the venepuncture site.

4. **Deep Vein Thrombosis** presents as oedema or swelling and associated discomfort in the upper arm. There may also be symptoms of superficial inflammation and thrombophlebitis. In severe cases, prominence of superficial veins on the ipsilateral chest wall may be noted (Urschel's sign). There is also a risk of pulmonary embolism.

4.5. DCSO response

The DCSO response to the donor should include the following actions:

1. Apologise to the donor for the experience of a VP-related adverse event

2. Undertake assessment of the donor's history and current symptoms

3. Make a provisional diagnosis (e.g. nerve injury secondary to haematoma), including any differential diagnoses if uncertain

4. Decide if further clinical assessment is required (e.g. A&E, GP) and advise donor accordingly (section 4.6)

5. Give self-care advice to the donor (section 4.7)

6. Agree further DCSO follow up

7. Advise re future donation, if appropriate at this stage of follow up

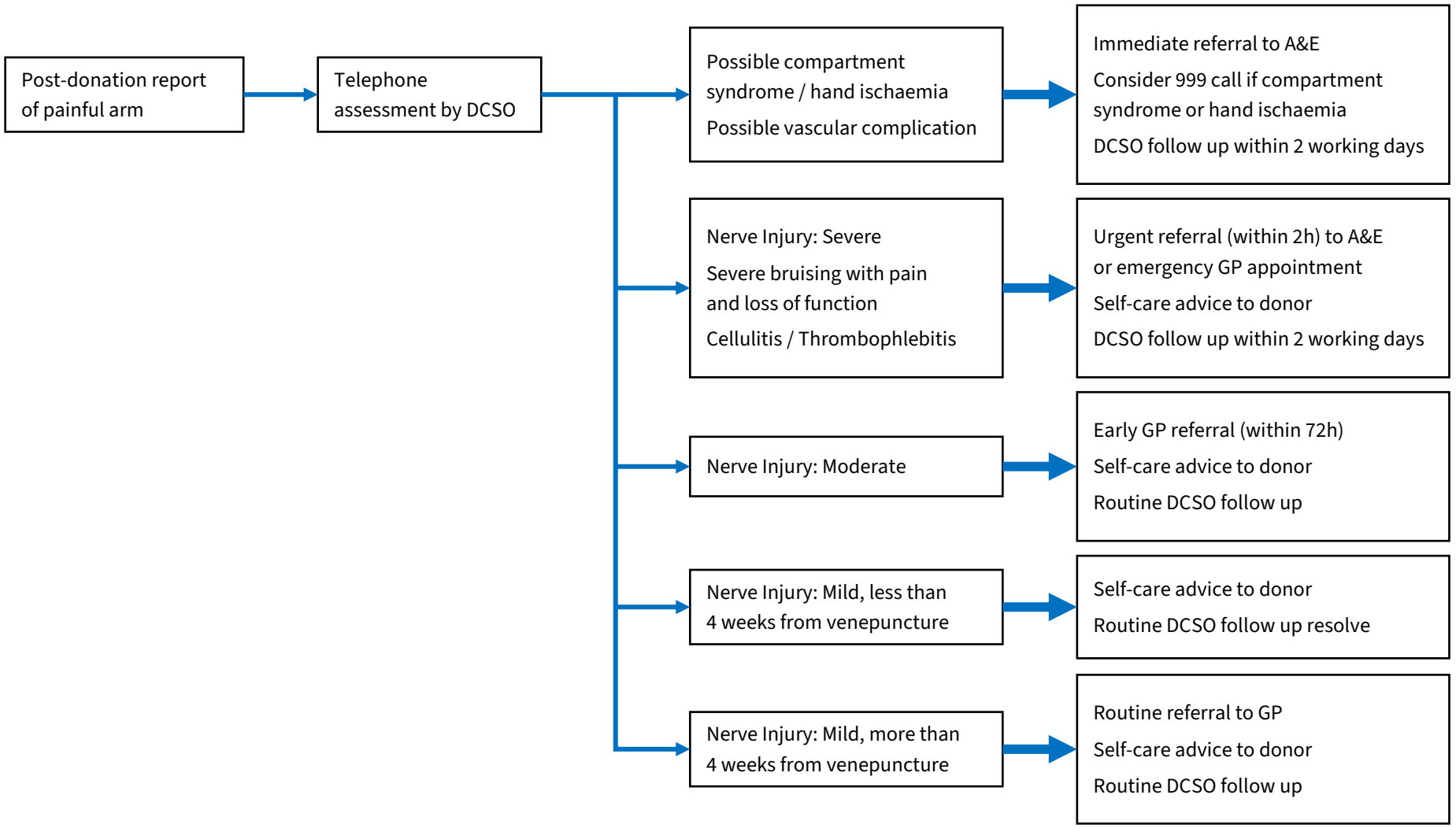

Figure 1. Flow chart for DCSO actions in response to post-donation arm symptoms

4.6. When to refer

Consider whether further clinical assessment is required for all donors who report arm complications after donation. A decision to refer to another clinical service (or to advise the donor to attend such a service) will depend on the nature of the complication, what local services are available and the donor's own expectations or wishes. If a serious arm complication is suspected, with or without a clear diagnosis, the donor must be directed to seek urgent clinical assessment with an appropriate service.

The following categories are guidelines for referral. Referral routes and timings may vary depending on individual circumstances including local availability and donor preference.

Immediate referral to A&E

- Symptoms suggestive of hand ischaemia / compartment syndrome. This is an emergency. Consider if a 999 call is required.
- Symptoms suggestive of a vascular complication (e.g. pulsatile mass in arm, symptoms of DVT)

Urgent referral (24hr) for further clinical assessment
(either A&E or emergency GP appointment)

- Symptoms of nerve injury, assigned as 'Severe' (section 3.4)
- Severe bruising, if associated with pain and loss of function
- Symptoms suggestive of thrombophlebitis or cellulitis

Early GP referral (72hr)

- Symptoms of nerve injury assigned as 'Moderate' (section 3.4)

Routine GP referral

- Symptoms of nerve injury, assigned as 'Mild' (section 3.4) lasting for four weeks or more after venepuncture

4.7. Self-care advice for donors

Give all donors with nerve injury, regardless of severity, the following self-care advice. Each service should also provide this advice in written form, if required.

1. Avoid movements which make the pain worse, but don't keep arm in one position. Gentle mobilisation is best.

2. Avoid heavy lifting or strenuous exercise

3. If swelling/bruise apply a cool pack and elevate arm. (Cool packs should only be applied for a few minutes at a time and should not be applied directly to the skin.)

4. Take painkillers for discomfort if needed (e.g. paracetamol)

5. Within the first 24hr of donation, avoid painkillers which can affect blood clotting (e.g. aspirin or NSAIDs such as ibuprofen)

6. Seek urgent clinical advice (e.g. emergency GP, NHS24, A&E) if symptoms get worse or new symptoms develop (e.g. worsening pain or swelling, symptoms affecting the hand, loss of arm function, painful redness or inflammation, general symptoms such as fever or feeling unwell)

7. Let the transfusion service know if your symptoms get worse or if you have to attend a clinical service for investigation and treatment

4.8. Advice for GPs

On occasions, individual services may wish to provide additional advice for GPs either when referring donors or following a direct request from a GP.

1. It is not the role of the DCSO to diagnose or prescribe a management plan for any individual donor with venepuncture related injuries. However, the following general advice can be given.

2. Advise avoidance of heavy lifting

3. Encourage gentle mobilisation. Immobilisation appears to predispose to chronic regional pain syndrome.

4. Application of cool packs may provide symptom relief. Take care to avoid prolonged or direct application of cold as this may cause further damage to the affected area.

5. Analgesia if required. NSAIDs should be avoided for the first 24 hours post venepuncture (NSAIDs can cause prolongation of bruising).

6. Analgesic options may include paracetamol, NSAIDs, tricyclic antidepressants, e.g. amitriptyline/nortriptyline, or anticonvulsants such as gabapentin/pregabalin. Topical lidocaine or capsaicin 8% patches are alternatives. Transcutaneous electrical nerve stimulation (TENS) may be used as pain relief. Consult local drug formulary guidance for treatment of neuropathic pain.

7. Consider physiotherapy referral. This is especially useful if there are functional deficits.

8. Consider referral to specialist services for donors with severe symptoms or symptoms lasting more than four weeks. Depending on local services and the nature of an individual's symptoms referral to the following specialties may be indicated: Orthopaedics, Plastic Surgery, Neurology.

5. Ongoing donor follow-up post nerve injury

5.1. Rationale for ongoing follow-up

Following initial contact and assessment, further communication should be arranged with the donor ideally until all symptoms have resolved. It is up to individual services to determine how best to achieve this.

There are several reasons why follow-up is required, including:

- As a courtesy to the donor who has experienced an adverse event as a result of donation
- To track the donor's recovery or worsening of symptoms including, in the early days following donation, identification of symptoms which require urgent onward referral
- To provide ongoing general support and information to the donor, including self-care information
- To ensure that any courses of action or treatment recommended have been followed through (e.g. referral to A&E or GP)
- To gather information about nerve injury including definite diagnosis of nerve injury and recovery times. Collection of robust national data on nerve injury post-donation will support effective benchmarking between services and will enable provision of better information to donors as part of the informed consent process.
- To identify longer-term serious injuries, such as those reportable to SHOT. These may be missed if follow-up is discontinued when the donor is passed to another agency for further investigation or treatment.

5.2. Frequency of follow-up calls

The frequency of call back is dependent on several factors including severity or potential severity of injury based on the initial assessment/diagnosis and on the donor's expectation and anxiety level.

If symptoms are ongoing but mild it is recommended that a follow-up call is undertaken at six months post donation. If this is not achievable, donors should be advised to call back to the service if their symptoms do not resolve by six months.

5.3. Content of follow-up calls

The content of follow-up calls will naturally change as time passes. Calls in the first few days and weeks following donation will focus on physical symptoms and self-care advice. Calls later in the timeline will mainly be to enquire about general wellbeing, progress of any investigations or treatment that is ongoing with outside agencies and data collection.

Specific content will vary from service to service but should include the following themes:

- Ongoing symptoms, noting any improvement, worsening or change. What impact do the symptoms have on the donor?
- Involvement of other health care professionals. Has the donor been reviewed and what was the outcome? Any treatment or further investigations planned?
- General donor support and reinforcement of self-care advice as appropriate
- Further referral, if required
- Future donation, if appropriate
- Agreed date of next contact

Continue follow-up, with the donor's agreement, until either symptoms have resolved or six months have passed since the initial injury.

5.4. Reporting of Donor Adverse Events

Blood Services should have mechanisms in place to record category and severity grading of Donor Adverse Events (DAE) as described in Chapter 5 of the Guidelines for the UK Blood Transfusion and Tissue Transplantation Services [7]. Donors who have symptoms which meet the criteria for a DAE of Grade 3 or above are recorded as Serious Donor Complications for reporting purposes. For venepuncture-related complications this threshold is met if symptoms affect ADL for two weeks or more, and/or require intervention, and/or persist for more than six months.

5.5. Duty of Candour

Consider whether there is a need to follow a Duty of Candour procedure for any donors reporting nerve injury symptoms which are serious or which persist for more than 28 days. This will be determined according to the requirements laid out in Duty of Candour guidelines applicable to individual transfusion services.

6. References

1. Arm Complications After Manual Whole Blood Donation and Their Impact. Newman B. *Transfusion Medicine Reviews*. 2013. 27:44-49.

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6. Epidemiology, Pathophysiology, and Management of Complex Regional Pain Syndrome. Pappargallo M, Rosenberg AD. *Pain Practice*. 2001. 1:11-20.

7. JPAC. Chapter 5: Collection of a blood or component donation. *Guidelines for the UK Blood Transfusion and Tissue Transplantation Services*. Available at https://www.transfusionguidelines.org/

Appendix: further information on nerve injury

A1. Nerve structure

Axons are the long thin processes arising from neurones (nerve cells) which transmit nerve impulses. In a nerve, individual axons are arranged in bundles called fascicles, held together by connective tissue:

1. **Endoneurium** - connective tissue surrounding an individual axon
2. **Perineurium** - connective tissue surrounding a fascicle
3. **Epineurium** - connective tissue surrounding the entire nerve

A2. Mechanism of injury

Three types of nerve injury occur:

Neuropraxia

Neuropraxia is the mildest form of nerve injury. The axons remain in continuity and nerve conduction is only transiently impaired. This can resolve quite rapidly (days to weeks).

Axonotomesis

Axonotomesis is a more severe injury in which axon continuity is disrupted. The epineurium remains intact but there is degeneration distal to the injury. The severity depends upon what proportion of axons have been damaged. Recovery can be via collateral sprouting (over weeks) and by primary re-innervation (peripheral nerves regenerate at about 1mm/day in the forearm). Resolution can take weeks to months.

Neurotomesis

Neurotomesis describes injury in which the entire nerve, including the epineurium, is transected with degeneration distal to the injury. This usually requires surgical intervention and is unlikely to spontaneously recover.

All three types of nerve injury can result from direct contact of the needle with the nerve, or from compression by haematoma or soft tissue inflammation.

A3. Clinical features of nerve injury

Numbness or tingling (paraesthesia) is the principal symptom of donors with nerve injury. This is often accompanied by pain that frequently radiates down the affected arm. The pain is often described as ‘burning’ or like ‘an electric shock’. As well as sensory changes, some individuals may experience loss of motor function.

Nerve injury usually associates with sensory and/or motor symptoms that map onto a specific peripheral nerve territory (see image below). The lateral and medial cutaneous nerves of the forearm are most often affected, but injury can occur to other nerves, including indirect injury secondary to haematoma formation

Signs and symptoms of individual nerve injuries following antecubital fossa venepuncture are summarised in the table and figure below.

Table 1. Signs and symptoms of specific nerve injuries

Nerve affected	Clinical manifestation of injury
Lateral Cutaneous Nerve of the Forearm (Lateral Antebrachial Cutaneous Nerve)	Pain and/ or sensory change from the antecubital fossa to the base of thumb i.e. the lateral distal forearm
Medial Cutaneous Nerve of Forearm (Medial Antebrachial Cutaneous Nerve)	Pain and/or sensory change anteriorly on the medial aspect of the forearm (little finger side)
Median Nerve	Pain and/or sensory change affecting the thumb, index and middle finger and the lateral half of the ring finger. If motor involvement, median nerve innervated muscles affected, including thumb weakness and pinch deformity
Anterior Interosseous Nerve (purely motor branch of the Median Nerve, no sensory fibres)	Pain in the anterior forearm. If there is complete nerve palsy the individual will present with a pinch deformity, i.e. the inability to make an 'O' with thumb and index finger. Rare
Superficial branch of the Radial Nerve	Pain and/or sensory change on the back of the hand and wrist, and over the base of the thumb. Rare
Ulnar nerve	Pain and/or sensory change affecting the front and back of the little finger and medial ring finger. Rare: if occurs usually secondary to haematoma formation

A4. Distribution of sensory nerves in the upper limb

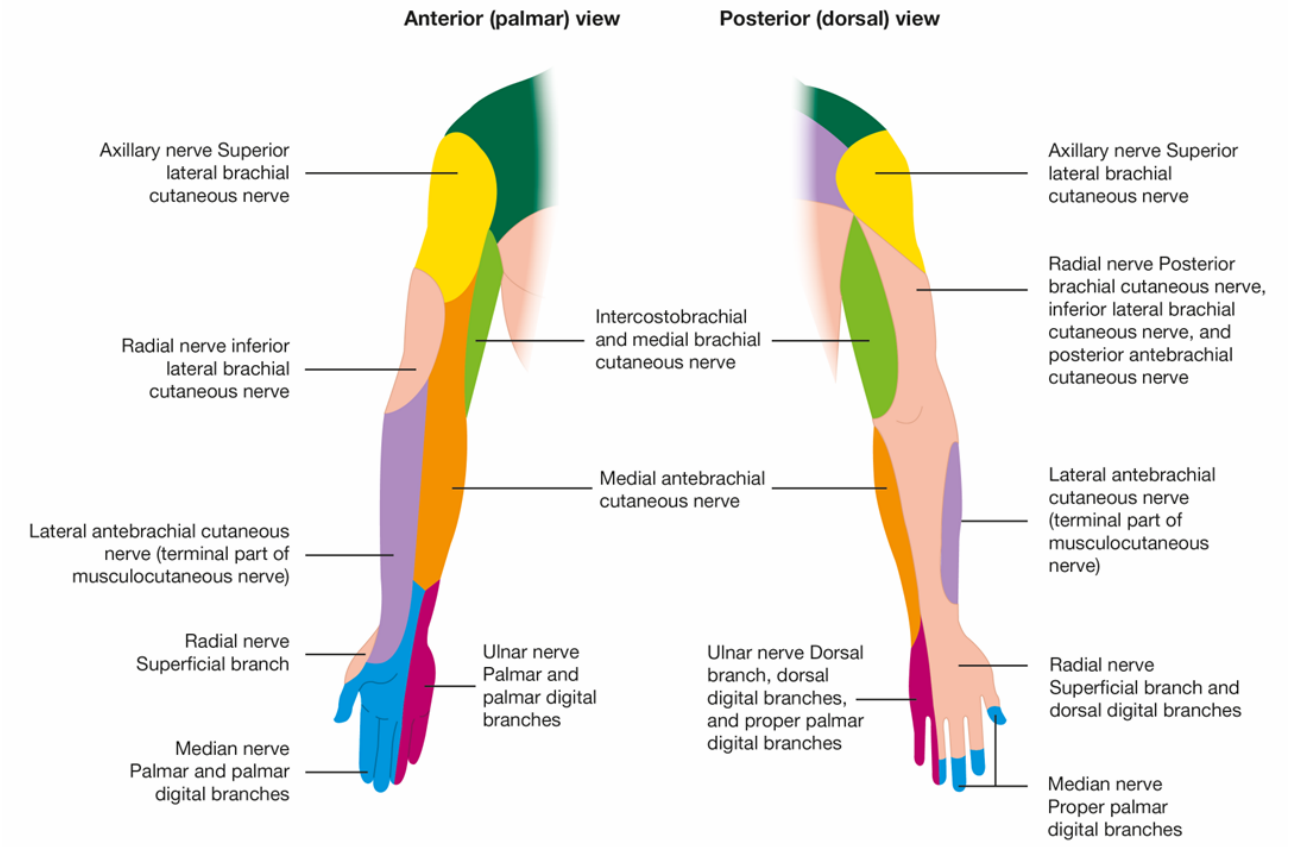

Figure 2. Sensory distribution in the upper limb

A4. Complex Regional Pain Syndrome (CRPS)

CRPS can be triggered by even minimal nerve injury. A diagnosis of CRPS should be considered if symptoms and signs are more severe and prolonged than would be expected from the initial degree of injury. There may be autonomic, sensory and motor features. Spread of pain and hypersensitivity to touch (allodynia) to adjacent areas suggest possible CRPS.

Mechanisms are complex, and symptoms often do not correlate with nerve injury as determined by nerve conduction studies. CRPS is thought to be caused by a combination of peripheral and central sensitization, autonomic changes, inflammatory and immune alterations, brain changes, genetic and psychological factors.