

The Provision of Services For Patients with Vascular Disease 2014



Service Specification for Non-Arterial centres in a Vascular Network

Recommendations of the Vascular Society of Great Britain and Ireland

1.0 Introduction

This document should be read in conjunction with 'Provision of Services for Patients with Vascular Disease 2012' published by the Vascular Society¹ and the 'Service Specification for Specialised Vascular Services' by NHS England².

These documents recommend reorganisation of vascular services in order to improve outcomes following elective and emergency interventions by concentrating inpatient care into arterial centres, which should be based around a population of at least 800,000 in order to ensure the most efficient use of staff, specialist equipment and facilities. The preferred model of care is delivered by centralising inpatient arterial care to a hub (Arterial Centre), with key aspects of the vascular service being maintained at spoke sites (Non-Arterial Centres). This serves the dual aims of generating the best outcomes for patients requiring inpatient care whilst delivering as much of the service as possible closer to the patient.

1.1 There is no single model that describes how vascular services should be provided at Non-Arterial (NA) Centres as this will be subject to local factors such as geography and pre-existing service configuration, but there are number of key factors to consider which will be common to all. These include provision of outpatient clinics, timely review of inpatient referrals, day-case lists and supporting allied specialities such as Diabetic Foot Services. Specific recommendations for the care of urgent diabetic foot problems and critically ischaemic limbs at the NA centre have been incorporated into this guidance below (see sections 14 & 16)

1.2 In many areas a hub and spoke type arrangement already exists and in such cases it is worth reassessing the model of service provision in light of the recommendations in this document. Of much greater importance is the potential impact of reorganisation on hospitals which currently have an established vascular service but which will be redefined as Non-Arterial Centres during reconfiguration. The main concern voiced during reconfiguration is that the vascular service at Non-Arterial Centres will inevitably become secondary to the demands of the central hub, with the risk that patients will have reduced access to specialist care and poorer outcomes. As a general principle speed of access to urgent vascular assessment and investigation should not be dependent on where a patient enters the network. Minimising inequalities should be a quality indicator of any reconfiguration, with patients prioritised according to need, not geographical location. Although these recommendations focus on the Non-Arterial centre, the standard of service provided should be equivalent across networks including the Arterial centre. It is imperative that proposed changes to service provision are communicated effectively to relevant parties throughout the reconfiguration process. In reality it will generally be the case that service reorganisation will result in improved access to specialist vascular care at non-arterial sites, for both elective and emergency cases.

2.0 Vascular consultant presence at Non-Arterial sites

Vascular presence at NA sites is primarily required to provide outpatient clinics, perform day case lists, manage ward referrals on inpatients admitted under the care of other specialties, support medical specialities and deal with patient related administration. The number of sessions required to fulfil these duties is dependent on the size of the hospital and it is recommended that they are spread sensibly through the week. It should not be regarded as a pre-requisite that a vascular presence is provided Monday to Friday from 9 to 5. The aim should be to ensure a presence on part, or all, of 3 to 5 days of the working week, which will enable inpatient referrals to be seen within 48hrs wherever possible. The temptation to timetable surgeons to be present at NA sites outside of specific sessions 'just in case of' an on-site vascular emergency, however, should be avoided, as it is in other healthcare sectors.

2.1 In order to provide a comprehensive service it is recommended that each NA site is allocated a minimum of 2 surgeons, with the number of delegated surgeons and sessions increased accordingly depending on the size of the NA unit. This helps foster the development of professional and referral relationships with other specialities and GPs and facilitates cross-cover. As a rough guide it is likely that about 40% of an individual consultants' job plan will be devoted to the NA site, with the remainder at the arterial centre for those consultants with a split site contract. Whatever arrangements are put in place, it is imperative that in the event of gaps in on-site presence, there are clear pathways in place describing the management of urgent referrals and vascular emergencies.

2.2 In most cases of reorganization, consultants at NA sites are unlikely to have regular junior medical support, and the service will be predominantly consultant delivered. If there are pre-existing arrangements with middle-grade support then these may be retained as part of delivering the agenda of teaching and training. In practice, this type of support is likely to be unpredictable, because of commitments to general surgery rotas, and should be regarded as supernumerary.

3.0 Vascular Specialist Nurses

It is envisaged that the role of Vascular Specialist Nurses (VSNs) will become increasingly important in the delivery of vascular services generally, especially at Non-Arterial Centres. It is recommended that, during any reconfiguration, their role is reviewed and developed as required in order to support consultant colleagues in outpatient clinics, facilitate management of inpatient referrals and act as a link for patients being worked up for inpatient treatment at the arterial centre. It is anticipated that VSNs will need to adopt a much more proactive role, acting as the patients advocate and the principle point of liaison between the network sites. In most cases it is likely that the existing VSN complement will need to be increased, with at least one VSN, working to the model described, allocated per site. One option would be to introduce a degree of rotation so that VSNs have commitments at both the arterial centre and linked Non-Arterial site. This would encourage professional development and team working as well as providing a degree of cross-cover.

4.0 Emergency cover

All Trusts will have systems in place for vascular cover and the only thing that needs to change is that the initial call regarding a vascular emergency will need to be directed to the on call vascular surgeon at the arterial centre. Emergencies deemed to require admission or urgent assessment will need to be transferred to the centre. There will, however, be rare occasions in which it may be necessary for a vascular surgeon to travel to the patient. In all circumstances the call for assistance will be directed to the arterial centre and the on call vascular surgeon will determine the most appropriate way to manage the case.

4.1 Ambulance services will need to be informed of the changes to vascular services and, where possible, steps should be taken to revise existing operating policies to enable direct transfer of vascular emergencies to the arterial centre, bypassing non-arterial sites. In the event that a vascular emergency presents at a Non-Arterial Centre there should be very clear guidelines to facilitate prompt ambulance transfer, especially in the case of suspected/confirmed ruptured aortic aneurysm. These arrangements are similar to those used to manage major trauma cases.

4.2 If an unforeseen vascular emergency occurs at the NA site the initial call for help should again be directed to the on call vascular surgeon at the arterial centre who will have to determine the best course of action. If a vascular surgeon is available locally they can be detailed to attend the case. If there is no vascular surgeon available locally it will be necessary to dispatch a surgeon from the arterial centre to deal with the emergency if transfer is impossible. It is therefore imperative that adequate vascular instruments and operating trays are kept and maintained at Non-Arterial Centres for such emergencies. This also applies to unplanned emergencies with Interventional Radiology (IR) procedures occurring in the angiography room at the NA centre. Bailout equipment such as covered stents to deal with bleeding should be available.

5.0 Outpatient Clinics

These form one of the main components of the service at NA sites, enabling patients to be seen closer to home. Clinic templates will need to be reviewed as part of any reorganisation in order to ensure there is sufficient capacity for the predicted demand. Booking systems should be able to flex the initially agreed template according to demand in order to ensure that clinics are used as effectively as possible. Templates should be flexible enough to enable urgent referrals to be seen within a week but there should also be a facility for very urgent cases to be seen at the NA unit within a shorter timeframe if clinically necessary. The system should also enable cases presenting urgently to A&E, or from GPs, to be seen in the next available clinic at the NA Centre, rather than being admitted as an emergency to the arterial centre.

5.1 It is recommended that, where appropriate, new patients should be offered a 'one-stop' service, with consultation and Duplex scanning taking place at their initial visit. This is convenient for patients and reduces the demand for follow-up appointments.

6.0 Vascular Laboratory support

An appropriately resourced Vascular Laboratory, in terms of both personnel and equipment, is crucial if the service is to be run as efficiently as possible, especially in terms of providing one-stop clinics and urgent investigation of inpatients from other departments such as Stroke and Diabetes. The Vascular Laboratory should have systems in place to provide follow-up of patients after arterial intervention, avoiding the need for further follow-up appointments after the first post-procedure visit.

6.1 Thought should be given to the possibility of developing a degree of cross-site cover by vascular technologists within the network in order to cover significant gaps in service at NA sites.

7.0 Other Diagnostic services

As far as possible most of the relevant diagnostic services should continue to be provided at Non-Arterial Centres within the network. In addition to Duplex ultrasonography patients should have ready access to CT and MR angiography. Image transfer is increasingly being facilitated by new PACS systems but where these are not yet in place there should be systems in place to ensure rapid transfer of relevant imaging.

7.1 For the most part it should be possible for most preoperative workup to be carried out at the Non-Arterial Centre, although more complex cardiorespiratory assessment such as cardiopulmonary exercise testing and stress echocardiography may only be provided at the arterial centre.

8.0 Inpatient referrals

There should be a well described system for making referrals, ideally electronically, or via a vascular secretary/PA at the NA site with the stated aim that patients are seen within 48hrs whenever possible. If consultant or VSN review cannot take place within a reasonable timeframe, or a more urgent opinion is required, the referrer will need to be directed to the arterial centre on-call consultant to discuss the best course of management.

9.0 Day-case lists

These serve the dual purpose of maintaining a vascular presence as well as treating patients locally and will form the bulk, if not all, of the operating at Non-Arterial sites. The overwhelming majority of day-case work will involve treatment of varicose veins and vascular access work.

9.1 For varicose veins treatment should follow the recently published NICE guidance³. Day case general anaesthesia lists may also be performed with provision made for on-site

cover, rather than transfer, of the rare patient who may subsequently require an overnight stay.

9.2 Vascular access work might be restricted to local and regional anaesthetic cases, which constitute the majority. This type of work may also involve placement of Hickman lines and implantable ports. More complex cases, such as those requiring general anaesthetic or an overnight stay in hospital, will be the subject of local discussion.

10.0 Interventional Radiology (IR)

There are a number of reasons for vascular IR work to continue in Non-arterial centres. These include capacity issues in the arterial centre, the commitment to treating patients closer to home and maintenance of non-vascular IR services. That said, it is important that there are agreed guidelines in place regarding this activity. Good MDT working will be pivotal in ensuring appropriate case selection and quality control. The complexity of cases manageable within this framework is for each network to determine and will be dependent on local expertise. Complex elective cases, hybrid cases and the majority of emergency cases will need to be performed at the arterial centre.

10.1 For day case endovascular procedures it is clearly important that vascular cover is agreed, with protocols in place to deal with complications. The responsibility for the care episode i.e. admission and discharge, should lie with IR.

10.2 Inpatient work should preferably be restricted to patients under other specialties e.g. Renal and Diabetes, whose treatment is discussed with the vascular team, but who remain under their admitting team for overall care. In addition there is the potential to transfer some elective IR day-cases from the arterial centre to NA sites in order to facilitate throughput and mitigate potential capacity issues in the arterial centre.

11.0 Multi-Disciplinary Team (MDT) working

This is now recognized as a key factor in driving quality of care provision. In order to be manageable within job planning constraints, however, the number of MDT meetings (MDTs) within a network should be rationalized. Models exist in which units combine all aspects of their work (carotid, peripheral, aortic, vascular access) into a large, single, weekly MDT or, alternatively, have separate MDTs for each aspect, with input from relevant specialties.

11.1 The technology now exists to enable multiple site participation at these network MDT meetings, avoiding the need to travel, and efforts should be directed at scheduling to enable maximal participation of all those wishing to be involved.

11.2 The long-term aim should be that all specialists involved in the vascular service should participate in MDT working, with mandatory attendance to at least 50% of relevant meetings. A well-structured, well-organized MDT encourages participation and should act as a trigger to revise job plans in order to enable attendance. This information is also crucial to commissioners planning the delivery of specialised

services based on the process of MDT working and should ensure that the NA sites have full participation in MDTs as a quality indicator.

12.0 Repatriation

The majority of elective patients at the arterial centre will be fit to be discharged home relatively soon after treatment and for these repatriation is not a major issue. An outpatient appointment at their local hospital with their vascular or diabetic specialist concludes a satisfactory episode of care.

12.1 A larger proportion of the urgent and emergency cases, however, will require prolonged rehabilitation and/or attention to social issues e.g. following amputation. The preferred solution, wherever possible, would be for these cases to be repatriated directly to either intermediate or community care without the need for repatriation to a NA site. If repatriation is deemed the most appropriate course of action then care should be transferred to an appropriate non-vascular specialist at the NA site (e.g. Diabetes, Care of Elderly, Stroke). There will therefore be the need to increase shared care arrangements between vascular surgery and these specialties at the NA site. Such transfers will rely on the NA site clinical staff maintaining the necessary competencies to manage post-op vascular patients. VSN support in the Non-Arterial Centre should be considered vital to on-going care, along with supervision from the visiting vascular consultant. Earlier repatriation to Non-Arterial Centres would make it easier for the arterial centre to accept transfers and improve continuity for outpatient follow-up.

12.2 It is strongly recommended that there are no named vascular beds in NA sites as this has potentially serious implications for continuity of care and cover, both in and out of hours. Vascular review by visiting surgeons and locally based VSNs will continue to be a feature of care but vascular input should really be minimal once deemed fit for transfer.

12.3 The emphasis should be on close working between the various relevant agencies to ensure that following acute vascular treatment, patients who are no longer deemed to require an acute vascular bed at the arterial centre should be transferred promptly along the most appropriate pathway.

12.4 It is recognised that in some networks there will continue to be named vascular beds at NA sites, at least during transition periods. It is important that there are clear guidelines regarding suitability for transfer into these beds and, more importantly, how cover is to be provided, especially out of hours. In the longer term it is recommended that networks come to arrangements that result in there being no vascular beds at NA sites.

13.0 Secretarial & administration support

Administrative support is vital in order to support smooth running of the service at NA sites and to act as an interface with the arterial centre. The level of support will depend on the size of the Non-Arterial centre and number of vascular surgeons involved. With on-site presence 3-5 days per week and co-ordination with the arterial centre a full time band 4 or above secretary will be required in many units.

13.1 At the arterial centre, particularly in networks with more than one NA site, a network co-ordinator would be important to ensure smooth transfer of patient information, and investigations. Close working between secretarial teams is crucial in order to co-ordinate booking of theatres lists to maximise utilisation and to avoid theatre cancellations for trivial reasons such as lack of notes and investigations.

13.2 Vascular surgeons with commitments to NA sites should have ready access to a desk and PC and should be able to access relevant IT systems remotely i.e. hub from NA centre and vice versa.

14.0 Diabetic Foot Services

The urgent care of diabetic patients with active foot problems (ulceration, infection, ischaemia and Charcot deformity) is best delivered by an integrated multi-disciplinary care pathway. The need for all organisations involved in the care of diabetic patients to have such pathways in place has been highlighted by Diabetes UK⁴, NICE⁵, and the All Party Parliamentary Group (APPG) on Vascular Disease⁶. Variations in amputation rates for Clinical Commissioning Group Areas has been linked to the absence of such integrated care pathways.⁶ Commissioners should ensure that all patients with diabetic foot problems have rapid and equal access to these care pathways, regardless of location, in order to reduce amputation rates.

14.1 With active diabetic foot problems there is often the need for urgent assessment, investigation and intervention. Concern has been raised that in the non-arterial centres, of vascular networks, the vascular contribution to the diabetic foot multidisciplinary team will be reduced. This could lead to delays, poor communication and loss of continuity resulting in suboptimal care with an increased risk of amputation. **It is therefore vital that diabetic foot care in the vascular network is organised to enable equal access to vascular expertise for the diabetic patient at both the arterial centre and the non-arterial centres.**

14.2 This guidance applies to urgent in-patient cases or problems presenting to the Emergency Department (ED) in the NA centre. Many less urgent diabetic foot problems are managed via multidisciplinary clinics. The vascular input to these clinics should not be altered by the reconfiguration of services. Visiting or local vascular surgeons will continue to contribute to such clinics. These clinics require the support of podiatrists, specialist nurses and orthotics.

The management of more urgent diabetic foot problems that cannot wait for the next clinic in the NA centre is the focus for these recommendations.

14.3 The Diabetic Foot Team. (see NICE CG 119⁵)

The makeup of the diabetic foot team in the NA hospital should follow NICE guidance. The team should be led by a diabetologist or physician with an interest in diabetes. Surgical input to the foot team should be available from both orthopaedic and vascular specialities. The precise local arrangements for vascular input to the team will be determined by the vascular network configuration. There may be on site local vascular surgeons and interventional radiologists who can contribute.

14.3a Alternatively the vascular input may be provided entirely by visiting vascular surgeons from the arterial centre. Clear lines of communication between the NA diabetic foot team and the visiting vascular team will be central to maintaining multi-disciplinary working. In many centres podiatrists play a major role in the foot team and can facilitate such communication with the vascular team. Vascular specialist nurses can also fulfil this important role. Clear protocols and pathways for referral should be in place between the NA diabetic foot team and the vascular service. Regular multi-disciplinary diabetic foot ward rounds and x-ray / imaging meetings can assist and speed up the management of these inpatient diabetic feet problems.

14.4 Emergency treatment of diabetic foot sepsis

When assessment by the NA centre diabetic foot team makes a diagnosis of acute infection, without significant ischaemia, and surgical intervention to drain and debride the foot is necessary, an emergency referral should be made. In the past this emergency service has often been provided by local vascular and general surgery teams. It may be possible in some networks to still provide this surgery locally at the NA centre. On call orthopaedic surgeons at the NA centre may be able to offer this service. These patients can be safely managed in the NA centre under the diabetic foot team with review and advice from orthopaedic foot and vascular surgeons.

14.4a However if a satisfactory emergency service for foot sepsis cannot be provided at the NA hospital then immediate transfer to the arterial centre is an alternative solution. This can be an admission to either the diabetic or vascular ward at the arterial centre. Providing there are good arrangements to repatriate these patients back to the NA diabetic foot team, this may provide a satisfactory solution in some networks.

14.4b It is important that this surgery is carried out by experienced surgeons who have the necessary training and expertise. These procedures should not be delegated to junior surgeons who have not been trained in diabetic foot surgery.

14.5 Vascular Assessment of the Diabetic Foot.

The initial assessment of the arterial supply to the diabetic foot will be by a member of the NA centre diabetic foot team (clinician, specialist nurse, podiatrist) using the NICE guidance:

- a) If limb ischaemia is suspected, obtain a history of any previous cardiovascular events and symptoms, including previous treatments and/or procedures.
- b) Inspect the limb for the following:
 - Colour and temperature.
 - Presence of gangrene or tissue loss.
 - Presence or absence of a peripheral pulse.

- c) Measure and document the ankle-brachial pressure where clinically possible, ensuring careful interpretation of the results.

Clinical features in an ischaemic diabetic foot requiring more urgent referral are:

1. Gangrene (beyond dry gangrene of an isolated digit)
2. Deep ulcers to bone or joint, significant tissue loss.
3. Spreading or deteriorating infection.

14.5a If the degree of concern is immediate and there is no on site vascular presence the on call emergency vascular surgeon at the arterial centre should be contacted for advice. They will decide if immediate transfer as an emergency is needed. Alternatively an assessment in the NA centre by the vascular team should be available within 48 - 72 hours.

14.6 Non-Arterial Centre In-patient Urgent Referrals.

Combined specialty clinics (diabetologist, vascular, orthopaedic) can efficiently assess the needs of many urgent but non-emergency cases. In-patients and ED cases that cannot wait until the next clinic should be referred to the NA centre diabetic foot team and assessed within 24 hours (NICE). Following this initial assessment a referral to vascular surgery for urgent advice should be made if there is concern about limb ischaemia.

14.6a When the initial NA foot team assessment suggests limb ischaemia but not with immediate threat to the limb, a local referral to the NA centre vascular team should be made. These referrals should be seen either on the wards or in clinic at the first opportunity, ideally within 48 hours of receipt of the referral (48-72 hours over weekends). If a local vascular opinion cannot be obtained in this timeframe referral should be made to the on call vascular surgeon at the arterial centre.

14.6b In-patients with an active diabetic foot problem should be reviewed on a daily basis. A combined ward round led by the diabetologist and including a vascular surgeon plus other members of the MDT can add to this daily review process. Recent relevant imaging can also be incorporated into this assessment with input from a local interventional radiologist. The frequency of these multidisciplinary ward rounds will depend on local demand. Weekly or twice weekly rounds are the most common arrangement. Day to day care of these patients will continue under the diabetic team as per NICE guidance. This will include the use of dressings, foot protection, and treatment of infection.

14.7 Vascular Imaging.

Further imaging of the lower limb arteries will be required when the clinical assessment suggests limb ischaemia is contributing to the current diabetic foot problem. For in-patients this imaging is required urgently in order to plan definitive treatment for the limb ischaemia and avoid rapid deterioration of the diabetic foot problem. If a significant delay in obtaining imaging is likely at the NA centre, the patient should be transferred to the arterial centre (see timelines 14.9b).

14.7a Non-invasive diagnostic imaging should be performed for the initial assessment, in most instances, rather than catheter angiography. The exact type of imaging used will depend on patient factors, (renal function, anticoagulation, body habitus) local expertise and availability. Duplex ultrasound, MR angiography and CT angiography can all be used to assess the lower limb arteries.

14.8 Vascular Intervention

The results of the vascular imaging at the NA hospital should be reviewed by the vascular team and discussed with the NA diabetic foot team lead as soon as possible. A local interventional radiologist should also be involved in these discussions and a plan for intervention made based on the imaging results.

14.8a If the combined NA foot team decision, including the local interventional radiologist, is for an endovascular intervention, then a clear decision is also required regarding where that intervention should be performed. There should be clear written vascular network guidelines regarding endovascular interventions at NA hospitals. These will dictate what interventions can be undertaken locally in the NA centre and those that require transfer to the arterial centre.

14.8b For endovascular intervention at the NA hospital the following factors should be considered

- Increased risk of bleeding complications (iliac angioplasty, coagulopathy). *Particularly if performed when there is no on site vascular surgeon.*
- Higher risk of embolic / thrombotic complications (extensive multilevel disease)
- Renal impairment and contrast nephropathy.
- Local audited outcomes – high success rate anticipated.
- Degree of clinical urgency. If the NA diabetic foot team has concerns about any delay in performing the endovascular intervention at the NA unit the arterial centre should be contacted immediately. Transfer for earlier intervention may be required.

14.8c When the NA foot team decision is that the endovascular intervention should be performed at the arterial centre transfer should not be delayed.

14.8d When the patient requires arterial surgical intervention the patient should be transferred to the arterial centre immediately in order for this to proceed.

14.9 Timeline for assessment, imaging and revascularisation

It is important that treatment for ischaemia in these acute diabetic foot cases is not unduly delayed. The above process of MDT assessment, vascular opinion, imaging and then finally a revascularisation procedure should not involve long delays. The exact degree of urgency will require local assessment and will depend on the presenting

symptoms and signs. However the principal that any delay runs the risk of on-going tissue damage must be considered at all times in an effort to minimise tissue loss and reduce the risk of amputation.

14.9a When the NA centre assessment is that revascularisation is a very urgent priority, within 24 – 48 hours, the use of the emergency vascular team (surgeon and interventional radiologist) at the arterial centre will often be needed to achieve this.

14.9b Suggested timelines for less urgent cases treated at the NA hospital are:

- NA diabetic foot team assessment within 24 hours (NICE guidance)
- Vascular input and imaging within 48 hours (72 hours over weekends)*
- NA centre Endovascular Revascularisation within 10 days.*

**time from receipt of referral by the vascular service.*

15.0 Amputations

Toe, ray and transmetatarsal amputations can be performed at the NA centre providing there is local surgical expertise. These procedures should be performed by or closely supervised by a Consultant surgeon. The decision to perform these procedures will be taken by the NA centre MDT with surgical input. The indication may be for the control of infection or removal of necrotic tissue following revascularisation. The appropriate orthopaedic or vascular advice should contribute to the MDT decision.

15.1 These procedures can be performed on operating lists at the NA centre. There should be vascular lists in the NA centres for non-arterial procedures (mainly varicose veins). These can also be used for “minor” amputations. The in-patient care of these patients should remain under the NA centre specialty, diabetes, care of the elderly, etc.

15.2 More proximal amputations, at or above the ankle, should be performed at the arterial centre. Where necessary, emergency transfer should be made to allow the amputation to occur without delay. The care at the arterial centre should follow the amputation quality improvement framework guidance⁷.

15.3 Many patients will benefit from rehabilitation at the NA hospital after initial recovery from the amputation procedure at the arterial centre. Clear protocols for the repatriation of amputees back to the NA centre should be in place to optimise the rehabilitation and on-going care of these patients.

16.0 Critical Limb Ischaemia (CLI)

Detailed analysis of the overall management of peripheral arterial disease (PAD) has been issued by NICE⁸. In addition the need for urgent and co-ordinated management of CLI to avoid amputation has been highlighted in a recent all-party parliamentary group report titled “Tackling peripheral arterial disease more effectively: saving limbs, saving lives”⁶. Both these publications provide detail and support for the recommendations made in this document. Patients with critical ischaemia must have equal access to CLI

care pathways whether presenting at the arterial or the non-arterial unit in vascular networks. Commissioners of vascular services should ensure that these pathways are in place, resourced and delivered. Minimising delays within these pathways is especially important including transfers between centres in both directions. Delays due to lack of available beds must be avoided. Written transfer protocols need to be safe and clearly communicated.

16.1 Definition – what is critical limb ischaemia (CLI) ?

Precisely defining the severity and urgency of critical limb ischaemia for every case is difficult. This problem was highlighted in the recent NICE review; “*Whilst there are a number of definitions and classification systems for PAD, these are not used consistently in either clinical practice or research settings*”. Since it is important in a non-arterial centre not to exclude or miss patients who may have severe PAD this guideline uses the following broad definition:

Critical Limb Ischaemia: - any patient with peripheral arterial disease and either chronic¹ ischaemic rest pain in the foot or ulceration / gangrene.

16.1a In terms of the commonly used Fontaine classification of limb ischaemia this equates to grades 3 (rest pain) or 4 (ulceration or gangrene). Other classifications include the use of ankle and toe pressures in an attempt to quantify the severity of ischaemia. These may not always be readily available in NA hospitals at short notice and are therefore not included in this guideline.

16.1b Leg ulcers are common in the elderly hospital population. A large proportion will be venous but some will be arterial or arterio-venous. Severely painful ulcers of the leg, with exposed deeper structures or necrotic tissue and absent pulses should be considered for more urgent management. Although ulcers with these features may not directly meet the criteria for CLI they should be referred to the vascular service using the CLI pathway.

16.1c It is important to distinguish chronic CLI from acute limb ischaemia. This is based upon the clinical assessment. Sudden onset of symptoms with pain, coldness, pallor and loss of function affecting all or part of the leg and foot represents acute limb ischaemia. The presentation is often within hours or a few days. These patients should be referred to the on call vascular surgeon at the arterial centre as an emergency. If there is any clinical doubt cases should be discussed.

16.2 Presentation at the Non-Arterial Hospital (see flow chart at end of document)

CLI will present in the NA hospital to other non-vascular specialties, in the following ways:-

¹*In general chronic symptoms are considered to have been present for at least 14 days.*

- a) **In-patients.** Admitted under another specialty, often acute medicine or care of the elderly. Clinical assessment raises a concern about the presence of CLI. This may or may not be related to the condition for which the patient was admitted. This can be a new diagnosis or the patient may already be known to the vascular service.
- b) **Emergency Department.** Referrals from general practitioners to acute medicine or surgery or patient self-referral to the ED.
- c) **Out Patient Department.** The diagnosis of CLI may be made or suspected in a non-vascular clinic. This may be a co-incidental diagnosis whilst the patient is being assessed or investigated for a separate condition. Alternatively this may be the suspected diagnosis for the problem leading to the referral to the clinic.

16.3 Assessment and Referral of CLI at the Non Arterial Hospital.

In the above settings the initial clinical assessment will be by non-vascular specialists (general surgeons / physicians, ED physicians). Once the clinical concern of CLI has been raised by this initial assessment, urgent referral to the local Vascular Service is required to confirm the diagnosis and plan management. Robust mechanisms must exist in the NA hospitals for these urgent referrals to be communicated to the local on-site Vascular Service the same or next working day. Secretarial, Managerial and Specialist Nurse contact details must be readily available at all times

16.3a In-patients should be seen and assessed on the ward the first day that a vascular specialist is next on site (3-5 days per week). This expertise can be supplemented by other health care professionals such as Vascular Nurses and Podiatrists who may have the expertise to assess patients for CLI.

16.3b For patients presenting to the ED or the outpatient department the degree of urgency will need to be taken into consideration before referral to the Vascular Service. Patients not requiring immediate admission for management of the CLI can be referred urgently to the next vascular outpatient clinic at the NA hospital. These referrals should reach the local NA vascular clinic administration the same or next working day.

16.3c Where there is immediate concern about the severity of the CLI, the patient should be discussed with the on-call emergency vascular surgeon at the arterial centre. They may arrange for the patient to be admitted to the arterial centre as an emergency. Alternatively they may decide that the patient can wait until the next vascular clinic at the NA hospital. A local referral can then be made.

16.4 Imaging for CLI at the Non-arterial Hospital.

Imaging of the lower limb arteries will be required when assessment by a member of the vascular team (Consultant, Specialist Nurse, Podiatrist) confirms CLI. It may be

possible with current in-patients to obtain this imaging whilst the patient remains in hospital. This will reduce delays and will be the preferred option in many cases. If there is a long delay obtaining in-patient imaging at the NA hospital, the patient should be transferred to the arterial centre.

16.4a In some cases where the degree of ischaemia is judged by the vascular specialist to be less severe the patient may be discharged after completion of their current in-patient care and further vascular investigations arranged as an outpatient.

16.4b Imaging should be non-invasive in most cases. The specific modality used will depend on patient factors, (renal function, anticoagulation, body habitus) local expertise and availability. Duplex ultrasound, MR and CT angiography can all be used to assess the lower limb arteries.

16.5 MDT for CLI.

When the clinical urgency of the case allows, the results of vascular imaging should be discussed at an MDT meeting. Many networks will have a single central MDT for the discussion of all cases (see section 11). However some cases may be discussed in a smaller NA centre MDT following network protocols. This may be particularly suitable for non-complex, "routine" cases reducing the number of cases needing to be discussed at the main central MDT. These local MDT's should include the vascular surgeons and interventional radiologists as a minimum. In addition vascular nurse specialists, vascular scientists, an MDT co-ordinator or vascular administrator, podiatrists, and trainees should all be involved when they contribute to the NA vascular service.

16.5a The MDT will decide if local endovascular treatment can be undertaken. There should be clear written vascular network guidelines regarding endovascular interventions at non-arterial centres. These will dictate what interventions can be undertaken locally in the NA centre and those that require transfer to the arterial centre

16.5b There will be some urgent CLI cases that are transferred to the arterial centre for intervention prior to the next network MDT and are not discussed prior to intervention. The frequency of network MDT meetings will depend on local demand, but many will be either weekly or bi-weekly.

16.5c An important principle is that whenever possible patients with CLI will be discussed at a MDT meeting (local or central). Access to revascularisation should therefore be equitable across the network.

16.6 Vascular Intervention

The criteria to consider for safe endovascular intervention at the NA centre have been highlighted above (14.8b). When the patient requires complex endovascular intervention or arterial surgical intervention this should be organised at the arterial centre with either immediate transfer or urgent scheduling of the case on a planned procedure list.

16.7 Timeline for revascularisation

It is important that treatment for CLI is not unduly delayed. The above process of initial assessment at the NA hospital by a clinician from another specialty, getting a vascular opinion, MDT decision and a revascularisation procedure should not involve long delays. The exact degree of urgency will require local assessment and will depend on the presenting symptoms and signs. However the principal that any delay runs the risk of on-going tissue damage must be considered at all times in an effort to minimise tissue loss and reduce the risk of amputation.

16.7a When the non-arterial centre assessment is that revascularisation is a very urgent priority, within 24 – 48 hours, the use of the emergency vascular team (surgeon and interventional radiologist) at the arterial centre will often be needed to achieve this.

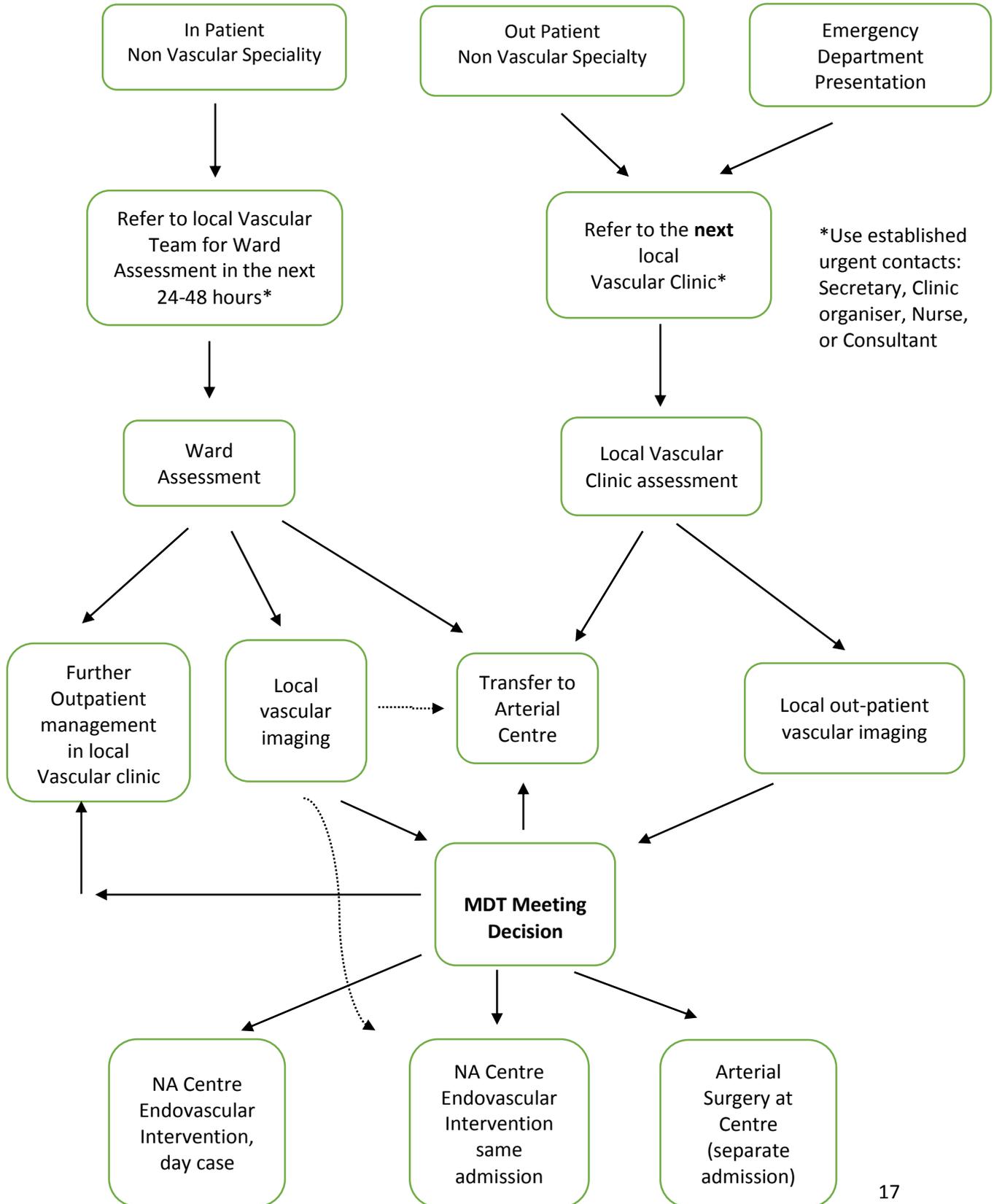
16.7b The following are suggested timelines for cases less urgent than this treated as in-patients at the Non-Arterial hospital. These are timed from receipt of the initial referral by the non-arterial centre vascular service.

- CLI with tissue loss: vascular assessment and imaging within 48 hours. (48-72 hours over weekends).
- CLI with tissue loss: endovascular revascularisation within 5 days.
- CLI no tissue loss: vascular assessment and imaging within 10 days
- CLI no tissue loss: endovascular revascularisation within 14 days.

Due to the variability inherent in the broad definition of CLI used in this guideline, some cases of CLI (for example rest pain with no ulcer or infection) will be managed as urgent outpatients at the NA centre. Some of these cases will tolerate a longer interval before revascularisation between 2-4 weeks. Treatment delays greater than this should be avoided.

Non-Arterial Hospital Critical Limb Ischaemia Referral pathways

Pathways for the management of Chronic Critical Limb Ischaemia. If the Non Vascular clinical specialist at the Non-arterial Centre is concerned about any immediate threat to the limb, they should contact the on-call Vascular Surgeon at the Arterial Centre. In other cases follow the pathways below:-



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8. [NICE guidance for peripheral arterial disease.](http://guidance.nice.org.uk/CG147/Guidance/pdf)
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