

A4

**2012/13 NHS STANDARD CONTRACT
 FOR ACUTE, AMBULANCE, COMMUNITY AND MENTAL HEALTH
 AND LEARNING DISABILITY SERVICES
 (MULTILATERAL)**

SECTION B PART 1 - SERVICE SPECIFICATIONS

Service Specification No.	A4
Service	Specialised Services for Vascular Disease (Adults)
Commissioner Lead	Cathy Edwards
Provider Lead	
Period	12 months
Date of Review	

1. Population Needs

1.1 National/local context and evidence base

- **National Context**

- Vascular disease relates to disorders of the arteries, veins and lymphatics. Conditions requiring specialised vascular care include: lower limb ischaemia; abdominal aortic aneurysm; stroke prevention (carotid artery intervention); venous access for haemodialysis; suprarenal and thoraco-abdominal aneurysms; aortic dissections; mesenteric artery disease; renovascular disease; arterial/graft infections; vascular trauma; upper limb vascular occlusions; vascular malformations and carotid body tumours. The scope of the specialised service includes deep vein reconstruction and thrombolysis for DVT but excludes varicose veins and IVC filter insertion.

- The prevalence of vascular disease increases with age. Average life expectancy continues to rise especially in males. This suggests that demand for vascular services is likely to increase over time. There are currently an estimated 3m people with diabetes mellitus in England, and prevalence is increasing. Vascular disease is the major cause of morbidity in diabetes and the risks of disease progression are higher, with an epidemic of diabetic foot disease expected in the next decade.
- Smoking is a major cause of vascular disease and over 80% of vascular patients are current or ex smokers. Around 20% of the population over 60 years of age have peripheral arterial disease, with about a quarter of these affected being symptomatic. Approximately 4% of men aged 65 have an enlarged aorta although not all go on to develop a significant aneurysm. The National AAA Screening Programme (NAAASP) will be fully instituted in the next year.
- Historically the UK does not compare well internationally for certain vascular procedures. It had the highest mortality rates in Western Europe following elective abdominal aortic aneurysm surgery (7.9% UK vs 3.5% Europe (Vascunet 2008) and is among the slowest nations for uptake of new endovascular technology. Patients are not always treated by a vascular specialist and stay longer in hospital following their surgery than the rest of Europe. There are also significant gaps in the provision of emergency interventional radiology services.
- The Vascular Society of Great Britain and Ireland (VSGBI) and the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) have called for a reorganisation of vascular services for emergency and elective care to optimise outcomes for patients. The Abdominal Aortic Aneurysm Quality Improvement Programme (AAA QIP) was initiated after the UK's higher mortality was recognised.
- A minimum population of 800,000 is considered necessary for an AAA screening programme and is often considered the minimum population required for a centralised vascular service. This is based on the number of patients needed to maintain competence among vascular specialists and nursing staff; the most efficient use of specialist equipment, staff and facilities, and the improvement in patient outcome that is associated with increasing caseload.
- Over the last few years there have been a number of changes in the structure of vascular service which will start to influence and improve service quality, efficiency and clinical outcomes. However more restructuring will be required to deliver high quality services on an equitable basis. A number of services are currently under active review with implementation plans delivering service changes during 2012/13. Progress

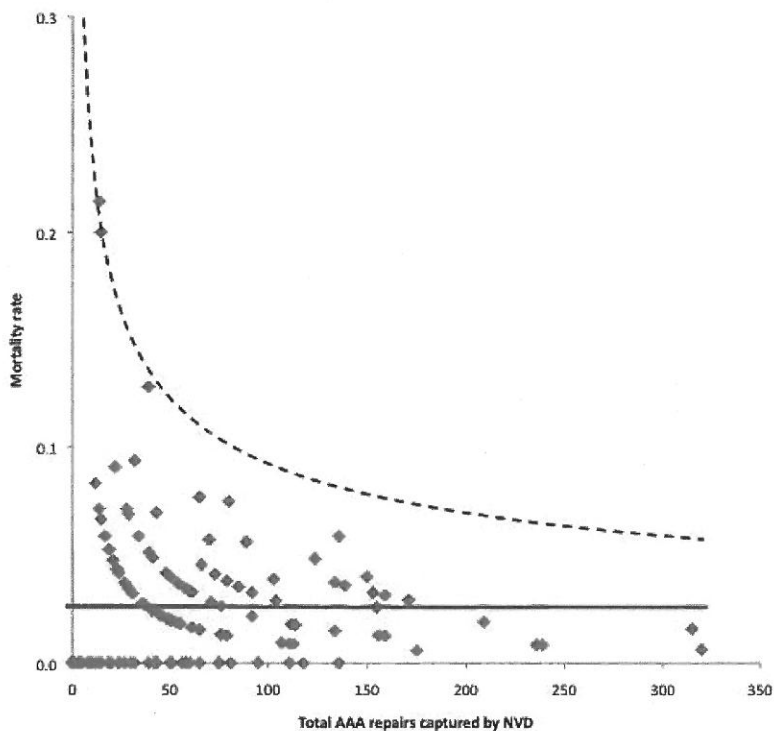
will need to continue on these reviews and the further reviews required ensuring the appropriate service configuration is achieved in the next 2-3 years. The context of these reviews also needs to incorporate the change in vascular surgical training. Vascular surgery became an independent speciality in 2012.

- **Local Context**

- **Evidence Base**

- In outlining the level and nature of service expected from providers, this service specification is written in the light of the recommendations and published evidence of the Department of Health (DH), the VSGBI, the Royal College of Radiologists (RCR), NCEPOD and all relevant NICE Guidance.
- The NCEPOD Report 2005 into patient outcome and death following abdominal aortic aneurysm (AAA) found the overall mortality rate for elective surgery was 6.2.
- The VSGBI and NCEPOD guidance on the provision of emergency and elective vascular surgery services states that the best outcomes are achieved in specialist vascular units with dedicated vascular teams available 24 hours a day, seven days a week.
- The VSGBI recommends fewer and higher volume units. The evidence supports minimum numbers of elective procedures that vascular units should undertake and links surgeon elective volume with outcome.
- The evidence base concerning the relationship between patient outcome and the organisation of vascular services has become more extensive over the past few years. There is a strong evidence base that suggests that mortality from elective aneurysm surgery is significantly less in centres with a high caseload than in units that perform a lower number of procedures. A meta-analysis of the existing literature (Holt, Poloniecki et al. 2007) reviewed studies containing 421,299 elective aneurysm repairs and reported a weighted odds ratio of 0.66 in favour of higher volume centres dichotomised at 43 cases per year. This result echoes meta-analyses of most complex surgical interventions and should be regarded as definitive and highly informative.

- However, although robust, meta-analyses can be criticised due to publication bias, heterogeneity and the predominance of data from certain countries. Additional information may be gathered by analysing national administrative data. HES data for elective aneurysm repair in the UK between 2001 (Holt, Poloniecki et al. 2007) demonstrated that the mean mortality for an elective repair was 7.4%, and that 80% of all aneurysm repairs were carried out in units performing less than 33 cases annually. Importantly, the mortality rate in the units with lowest caseload was 8.5% as compared to the 5.9% reported by units with a higher workload. Even more worrying are the many small volume centres where the elective mortality may often exceed 20%. A similar pattern was seen in a recent report from the Vascular Society – Outcomes after Elective Outcome of Infra-Renal AAA 2012, and it remains noticeable that some low volume units have mortality rates vastly in excess of the national average:



- Recent data have demonstrated that the early mortality difference observed between low and high volume units is maintained in the long term (Holt, Karthikesalingam et al. 2012).
- With regard to ruptured AAA, the absolute mortality differences between hospitals in the lowest and highest volume quintiles reached 24% (Holt, Karthikesalingam et al.). Data on operative mortality in isolation, only tells part of the story, as case mix and patients considered “unfit” for surgery must also be considered. In these areas there is evidence to suggest disparate practices, with no surgical intervention being offered to over 50% of emergency patients with ruptured AAA in low volume units as compared to approximately 20% in the highest volume centres (Holt,

Karthikesalingam et al.).

- Two recent studies have investigated the effect of endovascular repair on the volume-outcome relationship for elective aneurysm surgery. The studies demonstrated that:
 - Hospital volume was significantly related to elective aneurysm mortality for open repair, endovascular repair and the combined (open + endovascular) group (Holt, Poloniecki et al. 2009). There was a significant difference between endovascular mortality between the lowest and highest quintile providers (6.88 vs. 2.88%), and a 77% reduction in mortality was observed for every 100 endovascular repairs performed.
 - Higher volume hospitals were more likely to adopt endovascular therapy (44% in high volume hospitals vs. 18% in low volume hospitals)(Dimick and Upchurch 2008).
 - Hospital volume was an independent predictor of mortality.
 - Results were defined by the total aneurysm caseload rather than either endovascular or open cohorts alone i.e. hospitals with a large, predominantly endovascular, caseload also reported better than average results from open aneurysm repair.
- The most important aspect defining the provision of aneurysm (or any other) services must be the acceptability to patients. There is a clear trade off between the advantages associated with a high-volume centre and the difficulties caused by prolonged travel times for both patients and relatives. The acceptability of increased travel times was assessed in a study of 262 patients (Holt, Gogalniceanu et al.). Patients were asked to complete a questionnaire that was calibrated against the time an individual was willing to travel to access specific attributes of an aneurysm service. Approximately 92 per cent of individuals stated a willingness to travel for at least 1h beyond their nearest hospital in order to access services with a lower peri-operative mortality, lower non-fatal complication rates, a high annual caseload of aneurysm repairs, and routine availability of endovascular repair.
- Screening for men over the age of 65 for AAA has been introduced: National Abdominal Aortic Aneurysm Screening Programme (NAAASP) with full roll out to be achieved by 2013. It is hoped that there will therefore be an increase in activity for elective aneurysms and a gradual decrease in emergency aneurysm activity.
- The use of interventional and minimally invasive techniques is a rapidly developing area within vascular services and there is likely to be a further shift towards endovascular repair of aneurysm over coming years.

- Dimick, J. B. and G. R. Upchurch, Jr. (2008). "Endovascular technology, hospital volume, and mortality with abdominal aortic aneurysm surgery." *J Vasc Surg* 47(6): 1150-1154.
- Holt, P. J., P. Gogalniceanu, et al. "Screened individuals' preferences in the delivery of abdominal aortic aneurysm repair." *Br J Surg* 97(4): 504-510.
- Holt, P. J., A. Karthikesalingam, et al. (2012). "Provider volume and long-term outcome after elective abdominal aortic aneurysm repair." *Br J Surg* 99(5): 666-672.
- Holt, P. J., A. Karthikesalingam, et al. "Propensity scored analysis of outcomes after ruptured abdominal aortic aneurysm." *Br J Surg* 97(4): 496-503.
- Holt, P. J., J. D. Poloniecki, et al. (2007). "Meta-analysis and systematic review of the relationship between volume and outcome in abdominal aortic aneurysm surgery." *Br J Surg* 94(4): 395-403.
- Holt, P. J., J. D. Poloniecki, et al. (2009). "Effect of endovascular aneurysm repair on the volume-outcome relationship in aneurysm repair." *Circ Cardiovasc Qual Outcomes* 2(6): 624-632.
- Holt, P. J., J. D. Poloniecki, et al. (2007). "Epidemiological study of the relationship between volume and outcome after abdominal aortic aneurysm surgery in the UK from 2000 to 2005." *Br J Surg* 94(4): 441-448.

2. Scope

2.1 Aims and objectives of service

- Vascular services are commissioned to provide diagnostics and treatment for vascular disease. The principal specialities involved are vascular surgery and interventional vascular radiology.
- The overarching aim of elective and 24/7 emergency vascular services is to provide evidence-based models of care that improve patient diagnosis and treatment and ultimately improve mortality and morbidity from vascular disease.
- The service will deliver this aim by:-
 - Improving the patient experience, providing equality of access to the full range of vascular diagnostics and interventions and ensuring that patients are receiving a high quality of service, with access to the most modern techniques.

- Developing and sustaining the resilience of vascular services and the workforce providing those services.
- Improving mortality and morbidity rates for people with vascular disease and improving survival rates following hospitalisation.
- Improving complication rates following a vascular admission (short and long term).
- Reducing mortality rates by preventing death from ruptured abdominal aortic aneurysm and vascular trauma.
- Providing early intervention and treatment to achieve regional reductions in the incidence of stroke due to carotid artery disease and leg amputation due to peripheral arterial disease.
- Supporting other services to control vascular bleeding and manage vascular complications.
- Working jointly with the diabetic service to optimise care and minimise tissue loss.

Although care for varicose veins is often provided by vascular teams this specification excludes these procedures as they are not included in the specialised definition.

2.2 Service description/care pathway

This service comprises the following elements:-

- Diagnosis and assessment of vascular disease (including the input of the vascular laboratory and diagnostic imaging).
- Outpatient management of patients with peripheral arterial disease.
- Inpatient spells, emergency and elective activity.
- Day case activity.
- Outpatient follow up of patients receiving vascular surgery/endovascular interventions.
- Rehabilitation services particularly for post amputation care.

Service Model

- Vascular services need to be organised to allow reasonable volumes of elective activity to exist alongside an acceptable consultant emergency on call rota thus ensuring appropriate critical mass of infrastructure and patient volumes.
- There are two service models emerging which enable sustainable delivery of the required infrastructure, patient volumes, and improved clinical outcomes. Both models are based on the concept of a network of providers working together to deliver comprehensive patient care pathways centralising where necessary and continuing to provide some services in local settings.

- One provider network model has only two levels of care: all elective and emergency arterial vascular care centralised in a single centre with outpatient assessment, diagnostics and vascular consultations undertaken in the centre and local hospitals.
- The alternative network model has three levels of care: all elective and emergency arterial care provided in a single centre linked to some neighbouring hospitals which would provide non arterial vascular care and with outpatient assessment, diagnostics and vascular consultations undertaken in these and other local hospitals.

Vascular Networks

- All Trusts that provide a vascular service must belong to a vascular provider network.
- The network arrangements must be clearly documented and have clearly articulated governance arrangements. As well as the weekly multi-disciplinary team meetings there will be regular business meetings to ensure an inclusive and coherent approach to audit, education and training.
- To avoid any misunderstanding, it is envisaged that all arterial surgery will be provided at a vascular centre, with the facilities outlined below.
- Leg amputations should be undertaken in the arterial centres due to the need to improve/reduce the current perioperative mortality rate. It is recognised that, at present, due to capacity pressures, in the short-term, leg amputations may need to continue to be undertaken out-with the centres in designated units. Provider networks will work towards the aim of all leg amputations being undertaken in arterial centres by 2015 and develop a robust implementation plan to achieve this. In circumstances where leg amputations are undertaken outside the arterial centre the patient must be under the care of the arterial network and the procedure undertaken by a vascular specialist. All patients considered for amputation including those operated on locally will be discussed by the vascular multi-disciplinary team and will be given the same opportunities for limb salvage as those treated in the arterial centre. All amputation patients/procedures will be included in the network audit.
- In-patient surgery and interventional radiology will be available 24/7 within the arterial centre with a vascular on call rota for vascular emergencies covered by on site vascular surgeons and interventional radiologists to ensure immediate access for emergency procedures and post operative care. In practice that means a vascular medical team of a minimum of 6 vascular surgeons and 6 interventional radiologists to ensure comprehensive out of hours emergency cover.
- Each surgeon will need to have an appropriate arterial workload (e.g in the region of 10 AAA emergency and elective procedures per surgeon per year), which will necessitate an appropriate catchment area to generate sufficient case volume. A minimum population of 800,000 would be appropriate but for a world class service a larger catchment area will be required.

- A 24/7 interventional radiology rota may need to be organised on a network wide basis to ensure interventional radiology services for other specialties, in local hospitals, are not destabilised. All participants in the rota must have the appropriate skills and competencies to undertake the full range of vascular interventional radiological procedures. Emergency access to interventional radiology must be within 30 minutes.
- Where appropriate, day case and first line diagnostics procedures will be provided locally.
- The network may also agree that low risk peripheral vascular interventions can be undertaken locally, to utilise local skills and local catheter laboratory capacity. The scope of this local provision must be clearly defined and the activity must be included in the network audit arrangements.
- With regard to services for patients with chronic vascular conditions arising from venous insufficiency and diabetes, local models of care will be developed.
- Each vascular network will have a formalised description of where inpatient, day case and outpatient services are provided in the network.
- Local protocols will be agreed to provide high quality specialist care at any non-arterial hospitals in the network. Clear written arrangements will exist for cover of inpatients and the transfer of emergencies out of hours. Formal arrangements will also exist to enable vascular-specialists working predominately at a spoke hospital to support out-patient clinics, ward work and non arterial surgery on appropriate sites across the network.
- The provider network will nominate a lead vascular clinician and a lead manager with responsibility for ensuring and maintaining implementation of the standards set out in this service specification and locally agreed policies/protocols.
- All patients with vascular disease or vascular complications cared for outside the main arterial centre must have access to the same high quality of care and the same opportunities/choices of care as those patients who are in the arterial centre hospitals.
- The vascular service will provide a diagnostic and treatment service through a multidisciplinary team model.

Specialist Vascular Team

- Patients with vascular disorders will be cared for by specialist vascular teams. These teams will include vascular surgeons, consultant anaesthetists, interventional radiologists, vascular scientists, nurses, radiographers, physiotherapists, and rehabilitation specialists.
- The vascular multidisciplinary team will be hosted by the arterial centre. Clinicians providing emergency care will be part of the vascular services multi-disciplinary team and be delivering both in and out of hours care in the network arterial centre.
- Care of patients will be managed through regular multi-disciplinary team meetings which will occur at least once a week. The membership requirements for the

multi-disciplinary team meeting will include a range of clinical disciplines and be formalised. The documentation will include statements on minimum levels of attendance for individuals and quoracy. It is expected that all clinicians will attend multi-disciplinary team meeting on a regular basis.

- Emergency procedures will be reviewed at the next multi-disciplinary team meeting.
- Discussion at the multi-disciplinary team meeting will precede elective vascular procedures being undertaken.
- The specialist vascular team will also support the care of patients under the management of other specialties.

Infrastructure/Facilities

With regard to the whole vascular service across the network there will be access to the following:

- Outpatient Clinics – will include access to nurses experienced in ulcer and wound dressing. Doppler ultrasound machines should be available. There will be access to Doppler machines in the clinic.
- Vascular Laboratory – the vascular laboratory service will be available for the diagnosis and assessment of arterial and venous disease. (Service availability does not necessarily have to be within the confines of a vascular laboratory).
- Vascular Ward – patients with vascular disease will have access to dedicated vascular beds. There will be sufficient dedicated beds to accommodate the routine elective work and emergency admissions. Beds will be staffed by an appropriate skill mix of nurses who have been trained in the care of vascular patients. Doppler investigation will be available on the ward.
- Operating Theatres – a 24 hour NCEPOD emergency theatre will be accessible at all times to undertake emergency vascular procedures, with access to radiolucent operating tables, x-ray C-arms and specialist consumables. Imaging equipment should be good quality multislice CT (not 1st generation) plus workstation with appropriate software for endovascular planning. High quality imaging e.g. 12”C arm with addition/subtraction unit either in theatre or x-ray theatre suite. The elective vascular service will have access to dedicated theatre nurses with specialist training in vascular procedures.
- Anaesthesia – elective vascular services will have dedicated vascular anaesthetic input into elective services, from anaesthetists experienced in dealing with the vascular patient and with a special interest in this area.
- ITU and HDU – Facilities with full renal support must be available on-site to support the vascular service. Bookable HDU/ITU with sufficient beds will be available for elective patients.
- Limb Fitting Service – the vascular service must ensure its patients have access to a local limb fitting service, which meets the standards set by *The British Society of Rehabilitation Medicine*.

Care Pathways

The following care pathways will be documented by each vascular network:

- Management of acute rupture of AAA
- Investigation and management of stable AAA
- Investigation and management of carotid disease (link to stroke care pathway)
- Management of acute limb ischaemia
- Investigation and management of chronic vascular insufficiency
- Management of vascular access for renal patients, if undertaken by vascular specialists
- Management of vascular injury (including complications of angiography)

The following pathways are published by the Map of Medicine:

- Abdominal Aortic Aneurysm Screening
- Peripheral Arterial Disease Pathways including suspected disease, secondary care investigations, surgical revascularisation and shared care
- Venous thromboembolism pathways (VTE) risk assessment and prophylaxis and diagnosis and management

Highly Specialised Interventions

- Some interventions/treatment are very complex, rare or require other specialist input such as cardiothoracic surgeons e.g. thoraco-abdominal aneurysms. These procedures will only be carried out in arterial centres with the required skills and clinical linkages.
- There needs to be a close relation between vascular services and cardiology/cardiac surgery services and whilst colocation is desirable it is not essential.
- The introduction of new technologies will need to be managed and developed in line with commissioning policies. This may mean that only a small number of centres nationally are identified as a provider, with a greater catchment population than general arterial centres.
- The use of fenestrated and branched endovascular stents for repairing aneurysmal disease of the aorta is an area of developing practice in vascular surgery. A separate commissioning policy will describe the appropriate patient group to receive this treatment and the service provision requirements in order to deliver this treatment.

Pregnancy

- *Pregnant women with pre-existing conditions as discussed in this specification require assessment and/or management from highly specialist tertiary maternity care delivered within a dedicated multidisciplinary service staffed by a maternal medicine specialist, a physician, and supporting multidisciplinary team with extensive experience of managing the condition in pregnancy.*
- *In view of this, nationally commissioned condition specific services must have outreach arrangements with highly specialised tertiary maternity units with access to appropriate tertiary medical, surgical, fetal medicine, clinical genetics and level 3 Neonatal Intensive Care services. These specialised maternity services must have a critical mass of activity to maintain expertise, ensure best practice, training opportunities and for the organisational infrastructure, staffing, facilities and equipment to be clinically and economically efficient. They should have robust risk management and performance monitoring processes.*
- *All such women must receive personalised pre-pregnancy and maternity care planning from specialised tertiary maternity services to allow optimal disease management in the context of the pregnancy. This will reduce avoidable morbidity, mortality and unnecessary intervention for mother and baby.*
- *Women with conditions as discussed in this specification must be referred immediately once they are pregnant to plan their care. This must include access to termination of pregnancy and specialist advice re contraception .The individualised care plan must cover the ante natal, intrapartum and postnatal periods. It must include clear instructions for shared care with secondary services, when appropriate including escalation and transfer protocols and clear guidelines for planned and emergency delivery.*

2.3 Population covered

- Patients will experience varied contact with the service depending on the nature and severity of their condition. Patients will fall outside the scope of this specification when discharged from the care of the specialist vascular team.
- The service outlined in this specification is for patients ordinarily resident in England*, or otherwise the commissioning responsibility of the NHS in England (as defined in “Who Pays?¹”: Establishing the responsible commissioner and other Department of Health guidance relating to patients entitled to NHS care or exempt from charges).
- Emergency admissions ambulance coverage will reflect the network footprints. Bypass arrangements will operate to ensure arterial emergencies are taken directly to the arterial centre.

¹ Note: for the purposes of commissioning health services, this EXCLUDES patients who, whilst resident in England, are registered with a GP practice in Wales, but INCLUDES patients resident in Wales who are registered with a GP Practice in England. Specifically, this service is for adults with vascular conditions requiring specialised intervention and management, as outlined within this specification.

2.4 Any acceptance and exclusion criteria

- The service will accept all patients who have been referred via their GP or other health care professional to a vascular specialist within secondary or tertiary care, or who have presented as an emergency in secondary care and identified as a vascular emergency. There will also be referrals from the National AAA Screening Programme.
- This specification excludes the care of varicose veins as these procedures are outside the scope of the specialised service definition.

Vascular services for children are covered in the specialist paediatric surgery service specification.

2.5 Interdependencies with other services

Vascular services link to a range of other clinical specialties and services:

- Co-located services
 - Intensive care
 - Interventional radiology
- Interdependent services
 - Stroke surgery and vascular opinion on stroke management
 - Limb salvage surgery
 - Diabetes specialist hospital services and diabetic community services
 - Renal inpatient units
 - Interventional cardiology
 - Cardiac surgery
 - Thoracic surgery
 - Major trauma centres and trauma units
- Related services
 - Rehabilitation services
 - Limb fitting service

Relevant networks and screening programmes include:-

- Cardiac/Stroke networks
- Renal networks
- Critical Care networks
- Trauma networks
- AAA screening programme

3. Applicable Service Standards

3.1 Applicable national standards e.g. NICE, Royal College

- There is a range of guidance available covering vascular services which set out the required service standards. The most significant are:-
 - VSGBI: The Provision of Services for Patients with Vascular Disease 2012.
 - NHS Abdominal Aortic Aneurysm Screening Programme Guidance for Public Health and Commissioners, July 2009.
 - Royal College of Radiologists – Setting the Standards of Providing a 24 hour Interventional Radiology service, September 2008.
 - Royal College of Radiologists – Standards in Vascular Radiology – 2011.
 - NCEPOD Report 2005 – Abdominal Aortic Aneurysm – A service in need of surgery.
 - VSGBI and the Royal College of Surgeons – Training in Vascular Surgery and Standards for Vascular Training – 2011.
 - MHRA Joint Working Group to produce guidance on delivering the Endovascular Aneurysm Repair (EVAR) Service (RCR, BSIR, VSGBI, VASGBI, MHRA Committee on the Safety of Devices) – December 2010.

- **CORE STANDARDS**

The core standards which ultimately shape the configuration of vascular services include:-

- As the new specialty of vascular surgery is established provision will need to be made for the separation of vascular and general surgery with vascular surgeons only treating patients with vascular disease, this will be required at both consultant and trainee level.

- Patients with a vascular emergency will have immediate access to a specialist vascular team involving surgeons, radiologists, anaesthetists, clinical vascular scientists, specialist nurses, occupational and physiotherapists.
- The arterial centre in the network will perform a high volume of abdominal aortic aneurysm repairs per year. There is debate about the minimum/ideal volume of procedures. However, 6 surgeons, each with around 10 AAA procedures per surgeon per year would indicate at least 60 AAA procedures per centre.
- The arterial centre will also perform a high volume of carotid endarterectomy procedures. A minimum number of 50 is indicated.
- All Vascular consultants working in vascular networks must routinely enter data onto the following databases/audits:-
 - The National Vascular Database
 - The Carotid Endarterectomy Audit
 - The Aortic Aneurysm Repair Audit
 - Amputation Audit
 - The British Society of Interventional Radiology BIAS databases
 - TEVAR
 - IVC Filter Registry
- Endovascular aneurysm repair (EVAR) will only be performed in specialist centres by clinical teams experienced in the management of AAAs. These teams will have appropriate expertise in all aspects of patient assessment and the use of endovascular aortic stent-grafts including the necessary interventional radiology expertise to manage complications encountered during these procedures.
- Vascular centres providing post screening AAA repair must meet all the standards set out by the NAAASP.

NB: The AAA and CEA volumes quoted are currently indicators but over time as services are reconfigured will become the minimum.

- NICE guidance of significance to elective and emergency vascular services, exists as follows:-
 - CG10 Type 2 diabetes footcare – (January 2004)
 - CG66/87 Diabetes – type 2 (update): (May 2008/May 2009)
 - CG68 Stroke - (July 2008)
 - CG92 Venous thromboembolism – reducing the risk (January 2010)
 - CG119 Diabet foot problems-inpatient management – (March 2011)
 - CG127 Hypertension – (August 2011)
 - CG147 Lower limb peripheral arterial disease – (August 2012)
 - TAG167 Endovascular stent-grafts for the treatment of abdominal aortic aneurysms – (February 2009)
 - TA210 Vascular disease – clopidogrel and dipyridamole – (December 2010)
 - IPG52 Endovenous laser treatment of the long saphenous vein - (March 2004)
 - IPG60 Thrombin injections for pseudoaneurysms - (June 2004)
 - IPG74 Balloon angioplasty with or without stenting for coarctation or recoarctation of aorta in adults and children - (July 2004)
 - IPG079 Stent placement for vena caval obstruction - (July 2004)
 - IPG127 Endovascular stent-graft placement in thoracic aortic aneurysms and dissections – guidance (June 2005)
 - IPG163 Stent-graft placement in abdominal aortic aneurysm – Guidance (March 2006)
 - IPG229 Laparoscopic repair of abdominal aortic aneurysm - (August 2007)
 - (February 2009)
 - IPG388 Carotid artery stent replacement for asymptomatic extracranial carotid stenosis – (April 2011)
 - IPG390 Endovascular stent-grafting of popliteal aneurysms – (April 2011)
 - IPG399 Carotid artery stent replacement for symptomatic extracranial carotid stenosis – (April 2011)

4. Key Service Outcomes

Performance Indicator	Indicator	Threshold/Target	Method of Measurement	Frequency of Monitoring
Carotid Endarterectomy				
Time from first presentation (stroke or TIA) to carotid endarterectomy (percentage of appropriate symptomatic cases operated on within 2 weeks)	Maximum benefit of operation derived from early intervention	100% (tolerance 90% to allow for patient choice)	NVD	
Stroke rate (self-reported, 30 day) <ul style="list-style-type: none"> Disabling Non-disabling 	Key Indicator	Target 2%, less than 3% acceptable	NVD/HES	
30 day mortality	Key indicator	Target 1% (from UK carotid interventions audit)	HES	
Post-operative length of stay	Shorter stay indicates good use of resources	< 3 days (median from UK Carotid interventions audit)	HES/NVD	

Number of carotid endarterectomies performed per unit per year	Higher volumes associated with improved outcomes	Minimum threshold-30 cases per year	HES	
Aortic Surgery				
Elective infrarenal aneurysm mortality rate: • Case-Mix adjusted	Key Indicator	Target – 3.5% (Vascular Society) Demonstration of mortality within Vascular Society funnel plots	HES/NVD	
Ruptured infrarenal aneurysm repair mortality rate	Key Indicator	Demonstration of mortality within Vascular Society funnel plots	HES/NVD	
EVAR-Mortality rate • Case-Mix adjusted	Key Indicator	< 1%	HES/NVD	
Waiting time for assessment and intervention	2/52 wait for out-patient assessment 8/52 wait for intervention	Target 100%	?	
Length of stay (elective and emergency)	Shorter stay indicates good use of resources	Elective - <9 days median from HES Emergency <10 days median from HES	HES	

Number of cases operated on per year per unit (elective and emergency)	Higher volumes associated with improved outcomes	>50 per unit (Vascular Society Quality Improvement Framework for AAA)	HES	
Amputation for Critical Limb Ischaemia				
30 day mortality – casemix adjusted	Key Indicator	Demonstration of mortality within Vascular Society risk adjusted funnel plots	HES	
Amputation rate per 1000,000 population – case-mix adjusted	Appropriate figures demonstrate good limb salvage rates and adequacy of care for patients with diabetes or CLU	Range 10-76 per 100,000 depending on casemix	HES	
Waiting time for assessment and intervention	2/52 wait for assessment 8/52 wait for intervention	Target 100%	?	
Lower Limb Ischaemia: Infrainguinal bypass				
30 day mortality rate following infrainguinal • Casemix adjusted	Key Indicator	Target: Demonstration of mortality within Vascular Society funnel plot, National average 4.2% (Fourth National Vascular Database Report, Vascular Society report 2004)	HES	

Post-operative length of stay (infrainguinal bypass) casemix adjusted	Shorter stay indicates less complications, good use of resources and appropriate rehabilitation	Norms: Elective – median 8 days Emergency – median 14 days (HES)	HES	
In hospital graft occlusion rate a. Diabetic b. Non-diabetic	Marker of technical success of operation	Norms and benchmarks need to be established	NVD	
Ratio of prosthetic to vein grafts used	Vein graft associated with better outcomes	Target: Prosthetic graft rate 0% (Tolerance up to 25%) (Based on rate of 35% in Fourth National Vascular Database Report, Vascular Society report 2004)	HES/NVD	
In-hospital surgical site infection rate	Key Indicator	Norms and benchmarks need to be established	HES/NVD	
Waiting time for assessment and intervention	2/52 for assessment 8/52 for intervention	Target 100%	?	

Venous intervention (open, percutaneous or endovenous)				
Improvement in symptomatology and quality of life scores	PROMS provide an assessment of symptomatology and improvement in quality of life	Positive improvements in symptomatology score and quality of life score	PROMS	
Percentage of cases performed as day case	Indicates good use of resources	Target 100%	HES	
Global Measures:				
Readmission rate-stratified as: <ul style="list-style-type: none"> • Directly related to vascular admission • Indirectly related • Not related 	Appropriate rates indicates good quality care with low complication rates and good discharge planning	Norms and benchmarks need to be established. Current procedure specific benchmarks available at Dr Foster	HES	
Completeness of data submission to NVD (percentage)	Indicates engagement with clinical governance and quality improvement	Target 100% completion	NVD/HES	

