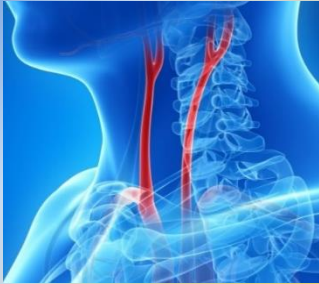


National Vascular Registry



HEALTHCARE IMPROVEMENT STRATEGY

August 2023



Royal College
of Surgeons
of England
ADVANCING SURGICAL CARE



OF GREAT BRITAIN AND IRELAND



British Society of
Interventional
Radiology

Registered Charity No: 1084852



HQIP

Healthcare Quality
Improvement Partnership

1. Introduction

The National Vascular Registry (NVR) was established in 2013 as a national clinical audit of hospital-based vascular services and evaluates the care and patient outcomes delivered by NHS hospitals in the UK. The most recent NVR Annual report was released in November 2022 and can be found on the VSQIP website – www.vsqip.org.uk

The Registry is commissioned by Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP). NCAPOP covers NHS services in England and Wales, and the NVR has established separate agreements to extend its scope to NHS vascular services in Scotland and Northern Ireland. The NVR encourages all NHS hospitals to participate so that, in addition to its role within NCAPOP, it continues to support the work of the Vascular Society of Great Britain and Ireland (VSGBI) and British Society of Interventional Radiologists (BSIR) and the Vascular Anaesthesia Society of Great Britain and Ireland (VASGBI) to improve the care provided by vascular services within the UK. The National Vascular Registry is also working with NHS England and Digital Health and Care Wales on the Outcomes and Registries Programme.

Vascular services treat patients with conditions that affect the circulation of blood and which form part of the broad spectrum of cardiovascular disease. There are two principal types of vascular disease: (i) atherosclerotic conditions, which concern the thickening, narrowing and occlusion of arteries, and (ii) aneurysmal conditions (outside of the heart and brain) in which an artery has widened and is at risk of rupture. Alongside these are other less common acute, but serious syndromes such as aortic dissection (a tear appearing in the inner layer of the aorta). A toolkit for aortic dissection has been recently published by NHS England.

The Registry covers major arterial procedures that are performed to reduce the risk of patients having cardiovascular events such as a heart attack, stroke, limb-loss, or arterial rupture. These procedures are used to treat patients with three vascular conditions:

- Peripheral arterial disease (PAD), which affects 12-14% of the general population. Services perform lower limb revascularisation procedures to restore blood flow in the leg or foot, or lower limb amputation if revascularisation is not possible.
- Stenotic carotid arterial disease. Carotid endarterectomy (and less commonly carotid stenting) is performed to reduce the risk of a stroke.
- Aortic aneurysms. An aneurysm can develop in the aorta, typically below the kidneys, and if this ruptures, it may result in sudden death. The repair of an abdominal aortic aneurysm (AAA) is recommended when the aneurysm is bigger than 5.5cm, and this may be accomplished with either an open or endovascular procedure.

The standards of care used by the NVR to evaluate vascular services are drawn from a number of sources (see appendix). These include in the Provision of Services for Patients with Vascular Disease (POVS)ⁱ document from the Vascular Society of Great Britain & Ireland (VSGBI), the Provision of Interventional Radiology document from the British Society of Interventional Radiology (BSIR)ⁱⁱ, Specialised Services: service specification for vascular disease from NHS Englandⁱⁱⁱ, recommendations from the report on vascular services published by the Getting-It-Right-First-Time (GIRFT) initiative^{iv}, and national clinical guidelines.

Other documents that describe standards of care for the individual procedures include:

For carotid endarterectomy

- National Institute for Health and Clinical Excellence (NICE). Stroke: The diagnosis and acute management of stroke and transient ischaemic attacks (NG128)^v
- National Stroke Strategy^{vi} and its associated publication Implementing the National Stroke Strategy – an imaging guide^{vii}

For repair of aortic aneurysms and related conditions

- The VSGBI. Quality Improvement Framework for AAA^{viii}
- Standards and outcome measures for the National AAA Screening Programme (NAAASP)^{ix} and Wales AAAA Screening Programme (WAAASP)
- NHS England. Toolkit for aortic dissection.^x

For peripheral arterial disease

- National Institute for Health and Clinical Excellence (NICE). Guidance for peripheral arterial disease (CG147)^{xi}
- The VSGBI. A Best Practice Clinical Care Pathway for Peripheral Arterial Disease^{xii}
- The VSGBI. A Best Practice Clinical Care Pathway for Major Amputation Surgery.^{xiii}

2. Strategy to develop improvement goals

Recent NVR Annual Reports describe various improvements in the quality of care delivered to patients with vascular disease, including significant increases in patients' survival after elective surgery over the last 10 years (92.8% in 2008¹, which had increased to 97.4% in 2021²). A key goal for the NVR is to ensure arterial procedures continue to be delivered safely.

The primary NVR improvement goals for the coming contract period (2023-2025) are to address the areas of concern highlighted in the most recent Annual Report:

¹ 1. Second Vascular Surgery Database Report 2008. European Society for Vascular Surgery. Eds: Gibbons C, Kinsman R, Walton P. Dendrite Clinical Systems Ltd 2008, ISBN 1-903968-21-6

² Waton S, Johal A, Birmpili P, Li Q, Atkins E, Cromwell DA, Williams R, Pherwani AD. National Vascular Registry: 2022 Annual Report. London: The Royal College of Surgeons of England, November 2022.

- Variation in the proportion of open to endovascular procedures (EVAR) performed, particularly for elective and emergency AAA repair.
- Long waiting times through care pathways after referral/assessment to elective AAA repair.
- Variation in the time taken for patients to move through the pathways between initial symptom and carotid endarterectomy (CEA).
- Variation in the time taken for patients undergoing a lower limb revascularisation procedure following a non-elective admission for chronic limb threatening ischaemia.
- Variation between providers for patients who have a major lower limb amputation receiving care as recommended in the VSGBI Amputation Quality Improvement Framework (QIF).

The time from referral / vascular assessment to treatment is a specific concern because a patient's condition can deteriorate during this time, and excessive delays can lead to worse outcomes. Additionally, waiting long periods (sometimes without an indication of when a procedure will be scheduled) or cancellations and rescheduling can be very stressful for patients with a time critical or life threatening condition.

The NVR will continue to engage in other quality improvement work that is focused on particular conditions such as the treatment of aortic dissection as well as national initiatives like the medical devices and outcomes programme. However, these are not considered in this document because the activities reflect either national initiatives or involve supporting (NIHR-funded) research. This work could result in future iterations of this strategy and developments such as the incorporation of performance indicators from the acute dissection toolkit.

National Improvement goals

The NVR has chosen three goals that are measurable using NVR data and align to the documents referenced above.

1. Maintain low rates of death after all major arterial procedures
2. Reduce time to treatment for patients with urgent vascular conditions
3. Maintain low rates of complications after all major arterial procedures

Alongside this, we will promote participation by NHS vascular units and ensure the Registry has high-levels of case ascertainment for each of the different vascular procedures.

NHS vascular units achieve rates of death / complications that are comparable or better than other countries with similar healthcare systems. In 2021, in-hospital postoperative mortality rates for elective procedures were^{xiv}: 0.6% for lower-limb angioplasty, 1.3% for lower-limb bypass, 3.1% after open repair and 0.5% after EVAR for intact AAA. 2.3% of patients died and/or had a stroke within 30 days of a carotid endarterectomy. While we

have framed the two outcome related goals as maintaining low rates of death / complications, we will look for opportunities to improve performance on these outcome measures and respond to evidence on which interventions will improve outcomes as it evolves. We will continue to assess outcomes across NHS vascular units and aim to identify units which have better than expected outcomes and from which lessons can be learnt.

These goals provide a set of high-level objectives. The NVR will be responsible for providing vascular units with information on the relevant indicators, and for highlighting / making recommendations on issues that are identified during the audit cycle. Where appropriate, indicator targets will be sourced from national guidance. At a local level, we expect all members of the vascular multidisciplinary team will be involved in adopting local QI strategies in two to three areas where a unit is identified as having comparatively poor performance. Vascular units excelling in all areas will be expected to adopt local QI strategies in areas where they believe improvement may still be made. Table 1 sets out key drivers of each objective.

We highlight that the outcome indicators in Table 1 are focused on short-term events. This reflects the design of the NVR and the need to avoid asking vascular units to submit follow-up data that is difficult to collect. We plan to link NVR patient records to national hospital administrative datasets (e.g., Hospital Episode Statistics (HES) in England and Patient Episode Database Wales (PEDW) and the Office for National Statistics (ONS) death register to enable the generation of longer-term outcome indicators such as:

- re-intervention rates after endovascular procedures and
- amputation-free survival for lower limb revascularisation procedures
- 1-year survival

There are, however, various practical issues to work through before these long-term outcome indicators can be implemented, including ensuring high-rates of linkage are achieved and ensuring the administrative data extracts can be linked on a regular basis and with a sufficiently short time lag.

We will build our quality improvement activity around a strong communication strategy that consists of three (inter-related) elements. First, we will support clinical staff in the implementation of best practice by publishing key indicators for local benchmarking. These indicators will be published quarterly on the NVR dashboard, and be presented in appropriate formats to promote QI initiatives (e.g., run charts). We expect this process will build on current NVR performance indicators, so that the Registry provides continuity for NHS vascular services.

Second, we will continue a programme of quality improvement workshops / webinars, extending the work of the PAD-QIP. These will introduce quality improvement techniques

and how they can be applied (e.g., the implementation of faster pathways for patients with CLTI). These events will also provide a venue for the sharing of good practice.

Third, we will refine the NVR quality improvement toolkit. The toolkit contains several aids to help local teams to address areas of weakness identified by the indicator dashboard / state-of-the-nation report.

Table 1: Improvement goals and potential drivers

Quality Domain	Goal	Procedure	Indicators	Actions for local organisations
Safety, effectiveness	Maintain low rates of death after all major arterial procedures	Aortic repair	In-hospital mortality rate after AAA repair (intact or ruptured AAA), and other complex aortic procedures.	Use online reports within NVR IT system to monitor waiting times regularly.
		Carotid	30 day rate of death and/or stroke after CEA.	
		LL revasc	In-hospital mortality rate after lower-limb angioplasty, and lower-limb bypass procedures.	Export data from NVR IT system if local QI plans require bespoke analysis
		Amputation	In-hospital rate mortality after major lower limb amputation (truncated at 30 days).	
Timeliness, effectiveness	Reduce time to treatment for patients with urgent vascular conditions	Aortic repair	Percentage of patients with intact AAA operated on within 8 weeks of vascular assessment	Review access to non-invasive imaging
		Carotid	Percentage of patients receiving their CEA within 14 days of symptom by NHS organisation	Review access to anaesthetic review
		LL revasc	Time from emergency admission to lower limb revascularisation (lower limb angioplasty/stent and bypass) for patients with CLTI and tissue loss.	
		LL revasc	Time from referral to revascularisation (lower limb angioplasty/stent and bypass) for patients with CLTI	Review access to theatre lists / IR capacity
		Amputation	Time to amputation from assessment for patients having amputation after non-elective admission	
Effectiveness, Well led	Maintain low rates of complications after all major arterial procedures	Aortic repair	Percentage of patients aged <=70 years having EVAR as proportion of all AAA repairs	Review MDT decision making
		Aortic repair	Percentage of patients discussed at MDT meetings and who had a fitness assessment	Review MDT decision making and vascular assessment
		LL revasc	Percentage of patients who had a readmission to hospital within 30 days after lower limb revascularisation	Review of discharge planning / recovery after surgery activity
		Amputation	Percentage of major amputations performed 08:00 to 20:00	Review planning of theatre lists
		Amputation	Consultant vascular surgeon present in theatre for major amputation	Review planning of theatre lists / consultant rotas
		Amputation	Ratio of below to above knee amputations	Review MDT decision making

3. Improvement methods

The NVR will: (1) engage in key collaborations, (2) align with other initiatives in vascular care, and (3) provide outputs – to support quality improvement at the national, regional and local level. The NVR will use its patient and public involvement (PPI) strategy to ensure that patients / public representatives contribute to how our outputs are designed, conducted and disseminated. The two principal strategies for reporting NVR results will be producing:

- A short “state of the nation” report for NHS Trusts/Health Boards within England, Wales, Scotland and Northern Ireland. These reports will highlight where services should focus quality improvement activities.
- An indicator dashboard on the VSQIP website that contains NHS organisational-level results. These dashboard indicators will facilitate benchmarking and the monitoring of performance at regular intervals so improvements in performance can be tracked.

These outputs will be accompanied by a range of tools that will support their use by local services and other stakeholders, as described below.

3.1. National and regional

The NVR undertakes various activities that directly support national stakeholders and regional NHS organisations to tackle system-wide aspects related to the delivery of high-quality vascular services:

Stakeholder	NVR activity
<i>NATIONAL</i>	
NHS England, Wales, Scotland and Northern Ireland	Identify issues and make recommendations, on the organisation and delivery of vascular services, which might involve national leadership. Recommendations published in audit’s State of the Nation reports.
National incentives	Provide the Care Quality Commission (CQC), Care Inspectorate Wales, and Getting It Right First Time (GIRFT) with information to support local visits to NHS organisations. The information can highlight areas of concern if an organisation is an “outlier” on an NVR indicator.
NHS England	Vascular CQUIN on time from non-elective admission to revascularisation for patients with chronic limb threatening ischaemia (CLTI).
Professional organisations	Identify issues and make recommendations regarding the delivery of vascular care that fall within the remit of the professional organisations.
Patient and lay organisations	Assist patient charities by providing key NVR results in a manner that can be easily interpreted as part of the NVR’s PPI strategy.
<i>REGIONAL</i>	
Vascular Networks	Support the monitoring role of Vascular Networks by publishing results for their region/area. Assist with regional/network specific queries.

3.2. Local

The NVR supports NHS vascular services in their care of patients in the following ways:

NVR feedback activity	Description
Annual “State of the Nation” Reports	State of the Nation reports that allow NHS organisations to benchmark themselves against clinical guideline recommendations and the performance of their peers.
Web-based dashboard	Presents results for individual NHS organisations, stakeholders and patients / public that allows the user to see the results of a selected provider alongside other NHS vascular units.
Local Action Plan template	Allows NHS organisations to document how they will respond to the State of the Nation Report recommendations.
NVR IT system real-time reports	Tables of activity and outcomes that are generated within the NVR IT system that give an organisation an up-to-date view of their performance.
Data downloads	Organisations can download their submitted data from the NVR IT system for their own internal analysis.
Materials supplementary to the State of the Nation Report	Including tools for improving data completeness.

3.3. Improvement tools

The NVR website will include a [Quality Improvement Resources page](#) with links to the Royal College of Surgeons of England (RCSEng) website and other web-based material that direct healthcare providers to various QI tools (to be reviewed regularly and updated as appropriate), including:

- “How to” guides.
- Links to existing resources e.g. [Institute for Healthcare Improvement](#), [ELFT QI tools](#).
- Links to training courses for quality improvement e.g. [ELFT QI training](#).
- Good practice repository with contact information where possible.

3.4. Improvement workshops

- The NVR team plans to organise a series of workshops / webinars to highlight key components of the diagnostic and treatment pathways on topics related to achieving the NVR improvement goals. Delivery of the workshop in a face-to-face forum or online will depend upon the topics to be covered and the feasibility of attendance.
- The NVR team will discuss with the RCSEng QI Collaborative about sharing expertise for quality improvement initiatives going forwards.

3.5. Patient and public involvement

We will develop our NVR patient and public involvement (PPI) strategy in 2023 so that the NVR works in partnership with patients and public representatives and has their input into how our outputs are designed, conducted and disseminated.

- Patient representatives will be consulted regularly on the design of the audit and the communication of its results. They will be asked to advise on audit priorities as well as the content of the NVR dashboard and presentation of the annual State of the Nation reports.
- They will:
 - Actively participate in the production of the public and patient versions of NVR State of the Nation reports.
 - Advise on the design / function of its website to ensure that patients and the public can easily access audit results.

3.6. Communication and dissemination activities

The NVR will communicate regularly with stakeholders, including patients and the public in the following ways:

3.6.1. Newsletters

- The NVR Newsletter is distributed to key hospital-based stakeholders on a quarterly basis, highlighting quality improvement methods and tools (where appropriate). These are also all published on the VSQIP website for everyone to see.
- Project team members also contribute items for newsletters created by medical associations, patient associations.

3.6.2. Website and Social Media

- The VSQIP website will be reviewed and updated on a monthly basis (as appropriate), and houses the improvement tools described in [section 3.3](#).
- NVR Twitter account will tweet (and retweet) about key resources, publications or topics of interest to our stakeholders, including tools to aid quality improvement.

3.6.3. Conferences and Peer Reviewed Papers

The NVR will present audit results at national conferences, e.g. Vascular Society of Great Britain & Ireland, British Society of Interventional Radiology and British Anaesthetic Society of Great Britain & Ireland. It will also disseminate its findings to a wider, international audience by publishing articles in medical journals and other media.

4. Evaluation

- The NVR will report progress against improvement goals:
 - to the Project Board³: On an annual basis, during the audit's yearly Autumn meeting (following publication of the State of the Nation Report).
 - to HQIP at contract review meetings: On an annual basis, during the audit's yearly Autumn meeting (following publication of the State of the Nation Report).
- Results of the impact of NVR improvement plan will also be published in future NVR State of the Nation reports.

³ The Project Board is convened on a biannual basis.

Appendix: Standards of care informing the healthcare improvement strategy

ⁱ Vascular Society of Great Britain and Ireland (VSGBI). The Provision of Services for Patients with Vascular Disease. London: The Vascular Society, November 2021. Available at:

<https://www.vascularsociety.org.uk/userfiles/pages/files/Resources/FINAL%20POVS.pdf>

ⁱⁱ British Society of Interventional Radiology. Provision of interventional radiology services. Second Edition. September 2019. Available at: https://www.bsir.org/media/resources/provision-interventional-radiology-services-second-ed2019_klzYwZt.pdf

ⁱⁱⁱ NHS England. Specialised Vascular Services (Adults). <https://www.england.nhs.uk/wp-content/uploads/2017/06/specialised-vascular-services-service-specification-adults.pdf>

^{iv} Vascular Surgery GIRFT Programme National Specialty Report, March 2018. Available at: <https://gettingitrightfirsttime.co.uk/wp-content/uploads/2018/07/VascularSurgeryReportMar18-Q.pdf>

^v National Institute for Health and Clinical Excellence (NICE). Stroke: The diagnosis and acute management of stroke and transient ischaemic attacks. May 2019. Available at: <https://www.nice.org.uk/guidance/ng128>

^{vi} Department of Health. National Stroke Strategy (December 2007) http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_081062

^{vii} Department of Health Stroke Policy Team. Implementing the National Stroke Strategy - an imaging guide (2008). Available at: http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_085145.pdf

^{viii} Vascular Society of Great Britain and Ireland (VSGBI). Abdominal Aortic Aneurysm Quality Improvement Programme (AAAQIP) Team. Delivering a national quality improvement programme for patients with abdominal aortic aneurysms. London: September 2012. Available at: <https://www.vsqip.org.uk/reports/delivering-a-national-quality-improvement-programme-for-patients-with-abdominal-aortic-aneurysms/>

^{ix} NHS Abdominal Aortic Aneurysm Screening Programme. Quality Standards and Service Objectives. August 2009. Available at: <http://aaa.screening.nhs.uk/standards>

^x NHS England Acute Aortic Dissection Pathway Toolkit. Version 1.0. March 2022. Available at: <https://www.vascularsociety.org.uk/userfiles/pages/files/News%20resources/Acute%20Aortic%20Dissection%20Toolkit%20Final%2020220314.pdf>

^{xi} National Institute for Health and Clinical Excellence (NICE). Guidance for peripheral arterial disease. August 2012. Available at: <http://www.nice.org.uk/guidance/CG147>

^{xii} Vascular Society of Great Britain and Ireland (VSGBI). A Best Practice Clinical Care Pathway for Peripheral Arterial Disease. London: The Vascular Society, April 2022 update. Available at: <https://www.vsqip.org.uk/content/uploads/2022/05/PAD-QIF-2022-Update.pdf>

^{xiii} Vascular Society of Great Britain and Ireland (VSGBI). A Best Practice Clinical Care Pathway for Major Amputation Surgery. London: The Vascular Society, April 2016. Available at: https://www.vascularsociety.org.uk/userfiles/pages/files/Resources/Vasc_Soc_Amputation_Paper_V2.pdf

^{xiv} Waton S, Johal A, Birmpili P, Li Q, Atkins E, Cromwell DA, Williams R, Pherwani AD. National Vascular Registry: 2022 Annual Report. London: The Royal College of Surgeons of England, November 2022. Available at: <https://www.vsqip.org.uk/reports/2022-annual-report/>