

National Vascular Registry Report 2019: Summary for Anaesthetists

The NVR is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit and Patient Outcomes Programme and is designed to promote quality improvement within NHS hospitals performing vascular surgery by providing information on their performance.

The 2019 NVR report provides vital information on activity and outcomes from interventions in patients with vascular disease. It continues to provide a basis for improvements in the pathways of care and clinical outcomes for patients.

In this summary we present of those data with direct relevance to vascular anaesthetists. The full report is available at <https://www.vsqip.org.uk/content/uploads/2019/12/NVR-2019-Annual-Report.pdf>

Carotid endarterectomy

In 2018, there were a total of 4,178 carotid endarterectomies. The number of procedures recorded in the NVR has decreased significantly since 2011, when nearly 6000s procedures were performed. This seems to reflect a fall in activity rather than a reduction in case-ascertainment (being consistently >90% since 2014).

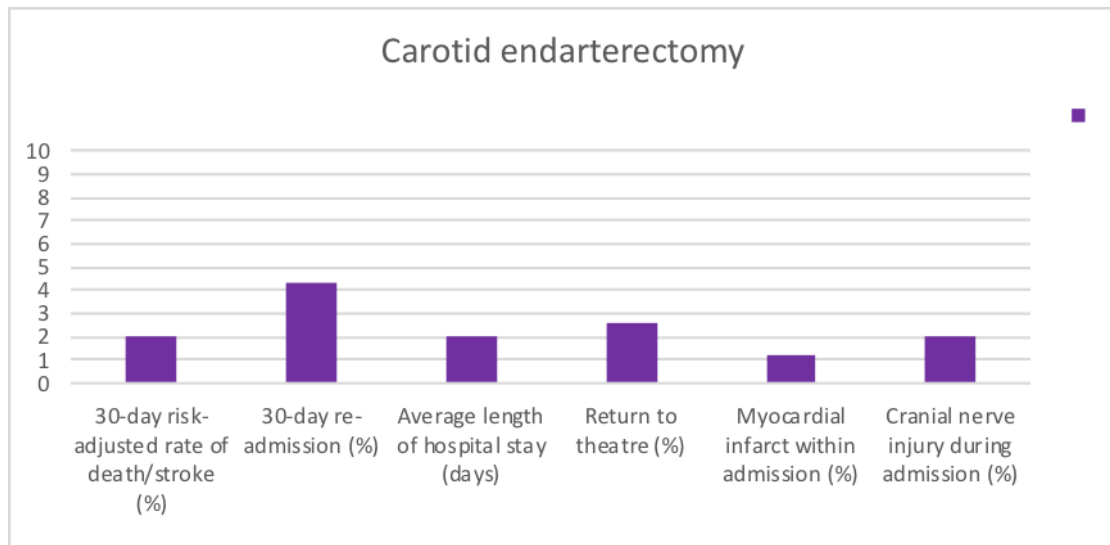
The median time from symptoms to surgery remained stable (12 days) compared to 2017.

Operative details of unilateral carotid endarterectomies performed during 2018:

- 60.1% were performed under General anaesthesia (GA) alone
- 17.5 % were performed under local anaesthetic (LA) alone, with 22.4 % combined GA/LA.
- 58.5% of procedures involved the use of a shunt.

Medication for cardiovascular conditions was common among patients prior to surgery. Overall, 88.7% were taking statins, while 83% were on antiplatelet medication.

Surgical outcomes continue to be good and estimated rates of significant complication are low (see full report for more details). Complication rates for CEA procedures performed in NHS hospitals between 2016-2018 were approximately 2%.



Areas of improvement highlighted by the report were:

- Time from symptoms to surgery. According to the NICE guideline CG68, the delay from symptom to surgery is recommended to be within 14 days to reduce the risk of patients developing a stroke. The median time from symptom to surgery (12 days) remained stable in 2018 compared to 2017; 60% of patients were treated within 14 days. There was considerable variation between NHS trusts. The median exceeded 20 days for 7 vascular units (less than half the number found in 2016).
- Case volume. There is a documented volume-outcome relationship between case volume and clinical outcomes for CEA. According to the VSGBI provision of services document, vascular units should perform a minimum of 40 CEA per annum. In 2018, there were 25 units that did not meet this standard. Further reconfiguration of services may be required, given the decreasing national caseload.

Repair of elective infra-renal aortic aneurysms

During the audit period (2016-2018) covered in the 2019 NVR report there were a number of changes in the organization of vascular services. The number of NHS vascular units performing AAA repairs decreased from 82 to 77. The median delays from vascular assessment to AAA repair tended to fall between 60 and 90 days. However, at 16 vascular units, 25% of patients waited more than 140 days in 2018.

There was a fall in the number of elective infra-renal AAA repairs performed, with 3,708 procedures performed in 2018 compared with 4,272 in 2017.

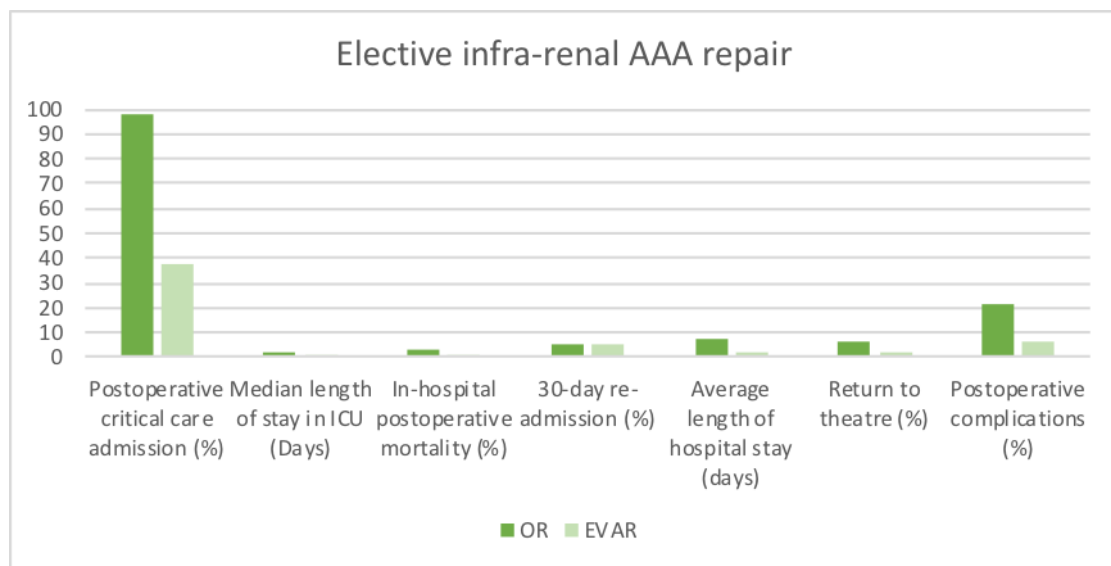
There was a drop in the number of endovascular procedures performed, with 63% of the elective infra-renal repairs compared to 68% in 2017. Interestingly, there was no corresponding increase in the number of patients having an open repair, and this could

indicate a more conservative approach to the management of sicker patients.

Patient outcomes after elective AAA repair improved dramatically following the VSGBI Quality Improvement Programme. Over the 3-year period from January 2016 to December 2018, the risk-adjusted in-hospital mortality rates for all NHS vascular units were within the expected range of the national average (1.4% for 2016-18).

Postoperative details of elective infra-renal AAA repairs undertaken between January and December 2018:

- 1358 open repairs (OR)
- 2350 endovascular repairs (EVAR)



Overall compliance with standards related to the elective AAA care pathway (Percentage of patients meeting standard)

	2018	2017	2016
Elective patients were discussed at MDT meetings	82	83.0	78.3
Patients underwent a formal anaesthetic review	95.4	96.3	96.6
Patients whose anaesthetic review was done by a consultant vascular anaesthetist	91.3	91.6	91.9
Patients had their fitness measured	85.5	84.7	83.9
Most common assessment methods:			
CPET	51.1	49.1	47.1
Echocardiogram	42.5	43.5	45.6

Repair of ruptured abdominal aortic aneurysms

During the audit period (2016-2018) covered in the 2019 NVR report, details of 2,474 procedures were submitted to the NVR, giving an estimated case-ascertainment of approximately 92%.

The choice of EVAR increased from 27.4% in the period 2014-16 to 30.0% during 2016-18. Patients undergoing EVAR for ruptured AAA had a lower in-hospital postoperative mortality compared to open repair. However, these figures for EVAR and open repair should not be directly compared because open procedures may represent the more complex cases. Further work is required to clarify which patients benefit most from the two approaches.

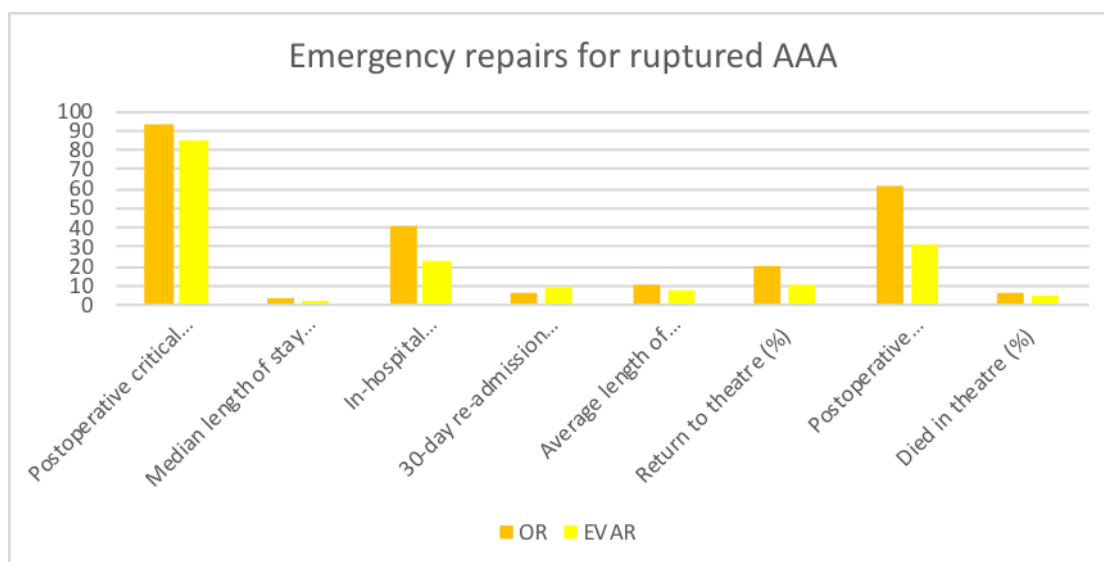
All NHS trusts demonstrated in-hospital mortality rates after repair for ruptured AAA within the expected range around the overall national average (35.4%). There was one NHS trust that had a mortality rate that was lower than the 99.8% control limit.

Compared to patients who had an elective repair of an infra-renal AAA, patients who had surgery for a ruptured AAA were older on average, with most aged > 76 years and tended to have a larger diameter of the aneurysm. In comparison to patients undergoing an open repair, patients having EVAR had a smaller AAA diameter, on average, and a greater proportion had also undergone AAA surgery previously.

We were able to get further data on anaesthetic technique used. Compared with elective EVAR less patients had GA alone (48% vs 68%) for emergency EVAR or GA plus RA/LA (51% vs 71%). This left 49% of patients having LA/RA only for emergency EVARS, compared to only 29% of elective cases.

Postoperative details of emergency repairs for ruptured AAAs undertaken between January 2016 and December 2018:

- 1732 open repairs (OR)
- 742 endovascular repairs (EVAR)



Lower Limb Interventions for Peripheral Artery Disease

1) Lower limb bypass

NHS hospitals submitted 17,295 open surgical bypass procedures to the NVR.

- 62.9% were elective procedures and 37.1% were emergency procedures
- Majority of patients were over the age of 60 years presenting for elective and emergency procedures, 78.1% and 81.6% respectively
- The report did not elude to type of anaesthesia as outlined in the 2018 report
- There was a high prevalence of hypertension (68.2%), followed by ischaemic heart disease (35.9%) and diabetes (33.9%) in this population. A small proportion of patients had no comorbid disease (13%)
- 83.8% of patients were recorded as being on one anti-platelet agent
- Timing to revascularisation:
 - Median wait from admission to surgery was 4 days
 - 58.4% of patients had their bypass within 5 days of admission
- The length of stay was 5 days for elective procedures and 15 days for emergency procedures
- Complications were relatively uncommon: 90% of elective and 82% of emergency procedures did not require a further unplanned intervention

The In-hospital postoperative mortality rate was 1.1% for elective patients and 5.3% for emergency patients. This rate was higher for emergency procedures where the bypass involved the aorta; 10.3% compared to 2.7% for elective procedures.

The reported highlighted that the in-hospital mortality following lower limb bypass has slightly improved over time and is steadily decreasing from 2.8% (2014 to 2016) to 2.6% (2016 to 2018).

In-hospital mortality rates comparing weekday and weekend emergency procedures were not assessed in this report.

Again, anaesthetic technique information was extracted. This showed 87% of procedures were done under GA (11% combined with RA/LA). Only 13 % were under LA/RA alone. Numbers were not adequate to show any effect of this on outcome.

Recommendations:

- Vascular units should review their pathways of care for patients with critical limb ischaemia using the VSGBI Quality Improvement Frameworks for peripheral arterial disease
- Patients admitted in an emergency with critical limb ischaemia should have a revascularisation procedure within 5 days.

2) Major lower limb amputation

Over the 3-year data collection period, 9,508 major unilateral lower limb amputations were entered into the NVR. A small proportion of amputations; bilateral amputations, amputations associated with a bypass procedure and major amputations secondary to trauma, were excluded from the report.

- 52.4 % below-knee amputations (BKA) and 47.6% above-knee amputations (AKA)
- Majority of patients requiring a BKA were diabetic (67.3%), compared to the majority being hypertensive (61.2%) in those requiring an AKA.
- It was common for patients to be on multiple medications (64.6% were prescribed antiplatelet therapy and 69.8% were prescribed a statin)
- Most patients were emergency admissions and > 80% underwent surgery during daytime hours
- A consultant was present in > 75% of cases, however, this did not relate to the severity of the ASA assessment
- 1 in 5 patients suffered a complication following major amputation; these were commonly respiratory (16.6%) and cardiac (14%) complications

Anaesthetic data showed 79% of procedures were done under GA but a significant number (23%) were combined with LA/RA. 21% were under LA/RA alone. No data on any outcome effect were given.

Recommendations:

- Vascular units should review local care pathways and patient outcomes for lower limb amputation outlined in the Vascular Society's Quality Improvement Framework
- Major amputations should be undertaken on a planned operating list during normal working hours
- A consultant surgeon should operate or at least be present in the theatre to supervise a senior trainee (ST4 or above) undertaking the amputation
- Vascular units should examine how to improve their performance against the shared NCEPOD and VSGBI QIF recommendations for amputation

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