

National Vascular Registry Report 2020: 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.

This year the NVR was quick to add fields related to Covid-19. The report therefore contains useful information on the impact of the pandemic on the care of vascular 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/reports/2020-annual-report/> and Covid report at <https://www.vsqip.org.uk/reports/nvr-2020-short-report-on-covid-19/>.

Carotid endarterectomy

In 2019, there were a total of 4,141 carotid endarterectomies. The number of procedures recorded in the NVR has decreased significantly since 2011, when nearly 6000s procedures were performed. Case ascertainment is 97%, so this data appears robust.

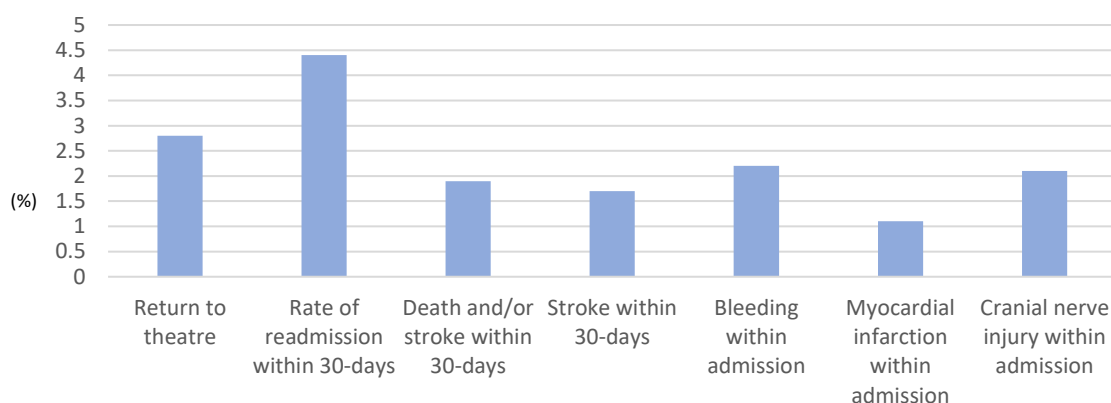
Operative details of unilateral carotid endarterectomies performed during 2019:

- 56.5% were performed under General anaesthesia (GA) alone
- 11.8% were performed under local anaesthetic (LA) alone, 5.5% with superficial cervical plexus block only.
- Combined GA/LA or block was used in 13.2 % (with 13% logged as 'other technique')
- 59.1% of procedures involved the use of a shunt.

Medication for cardiovascular conditions was common among patients prior to surgery. Overall, 83.3% were taking statins, while 90.8% were on antiplatelet medication.

Surgical outcomes continue to be good and estimated rates of significant complication are low at 2%. The median length of hospital stay was 2 days (IQR: 2-5 days).

Carotid Endarterectomy Complication Rates



Areas of improvement highlighted by the report were:

- Time from symptoms to surgery:** According to the NICE guideline NG128, the recommended target time from symptom onset to surgery is to be 14 days. The median time from symptom onset to surgery for symptomatic patients in 2019 was 12 days (IQR 8-22 days). There was however considerable variation between NHS trusts. Though median wait exceeded 20 days for 5 vascular units this is a considerable improvement from 2016.
- Case volume:** There is a well documented 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 2019, there were still 22 units that did not meet this standard. Further reconfiguration of services may be required, given the decreasing national caseload.

Major recommendation:

Review and improve referral pathways and access to theatre in networks to meet 14 day standard

Repair of elective infra-renal aortic aneurysms

During the audit period (2017-2019) covered in the 2020 NVR report there were a number of changes in the organization of vascular services. The number of NHS vascular units performing AAA repairs continues to decrease (from 78 to 75 last year). Total number of elective infra-renal AAA repairs performed also continue to fall; with 4,286 in 2017, compared to 3,445 in 2019. The overall case-ascertainment remains 95% over the last 3-years.

The median delays from vascular assessment to AAA repair tended to fall between 50 and 90 days. However, at 10 vascular units, 25% of patients waited more than 140 days in 2019.

There was another drop in the number of endovascular procedures performed, with 61% of the elective infra-renal repairs compared to 63% in 2018 and 68% in 2017. Interestingly, there was no corresponding increase in the number of patients having an open repair, these have remained stable in the last 2 cycles. This may be an early sign of changing practice in response to NICE guidance, but this will be clearer over the next few years. EVAR patients do tend to be

older and have more comorbidities. NVR does not collect data on patients turned down for AAA repair but the NAAASP has some data on those detected by surveillance. REF (Meecham 2020)

Patient outcomes after elective AAA repair improved dramatically following the VSGBI Quality Improvement Programme. Over the 3-year period from January 2017 to December 2019, the risk-adjusted in-hospital mortality rates for all NHS vascular units were within the expected range of the national average (1.4% for 2017-19). This was 2.3% for OR and 0.4% for EVAR in 2019.

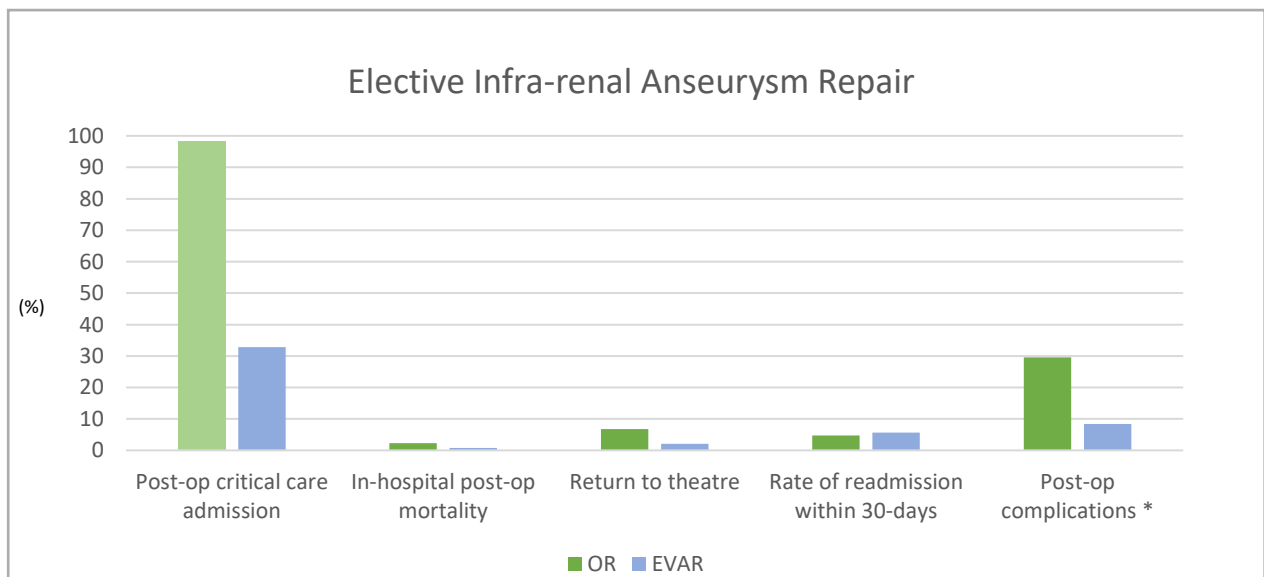
With EVAR mortality rates being so low, it is considered different measures of quality may be more valuable. As of 2020 revision/re-intervention rates will also be collected.

Postoperative details of elective infra-renal AAA repairs undertaken between January and December 2019:

- 1,355 open repairs (OR)
- 2,090 endovascular repairs (EVAR)

The median length of hospital stay was 7 days for OR (IQR 6-10) and 2 days for EVAR (IQR 1-3).

Anaesthetic data was extracted on EVARs. 75% had general anaesthesia (GA), in 69 % of whom it was the sole anaesthetic technique. 31 % had Local (LA) or regional (RA) as sole anaesthetic. Data on precise techniques or use of sedation was not available but may be an area for future investigation.



*Post-op complications include: cardiac, respiratory, haemorrhage, limb ischaemia, renal failure and other

Data is now collected against the standards of the VSGBI Quality Improvement Framework

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

	2019	2018	2017
Elective patients were discussed at MDT meetings	84.8	82	83.0
Patients underwent a formal anaesthetic review	94.7	95.4	96.3
Patients whose anaesthetic review was done by a consultant vascular anaesthetist	91.3	91.3	91.6
Patients had their fitness measured	83.2	85.5	84.7
Most common assessment methods:			
CPET	59.2	51.1	49.1
Echocardiogram	36.3	42.5	43.5

This was the first report to examine frailty assessment in elective AAA repair. Some measurement of frailty was made in 2516 (73%) of patients. The majority (72.3%) were 'not frail' but frailty was present in significantly less OR than EVAR patients (14.8 vs 36.7%). Length of stay was impacted by frailty in ORs but no overall mortality effect was demonstrable using one year's data.

Major recommendations were:

1. Improved compliance with AAA framework – aiming for 90% compliance with some assessment of fitness and mdt discussion
2. Meet AAA screening programme of referral to repair < 8 weeks for all non-complex AAAs in 80% of cases

Repair of ruptured abdominal aortic aneurysms

During the audit period (2017-2019) covered in the 2019 NVR report, details of 2,229 procedures were submitted to the NVR, giving an estimated case-ascertainment of approximately 93%.

The choice of EVAR continues to increase from 27.4% in the period 2014-16 to 30.0% during 2016-18 and was 31.5% in this period. Patients undergoing EVAR for ruptured AAA had a lower in-hospital postoperative mortality compared to open repair (20.2% vs 41.1%). OR is associated with longer length of stay and a greater proportion of cardiac, respiratory and renal complications. However, these figures for EVAR and open repair should not be directly compared because EVAR patients are likely to be more stable and have more favourable anatomy. 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 (34.5%). The range is 20-60%, so reflects some centres with relatively low volumes.

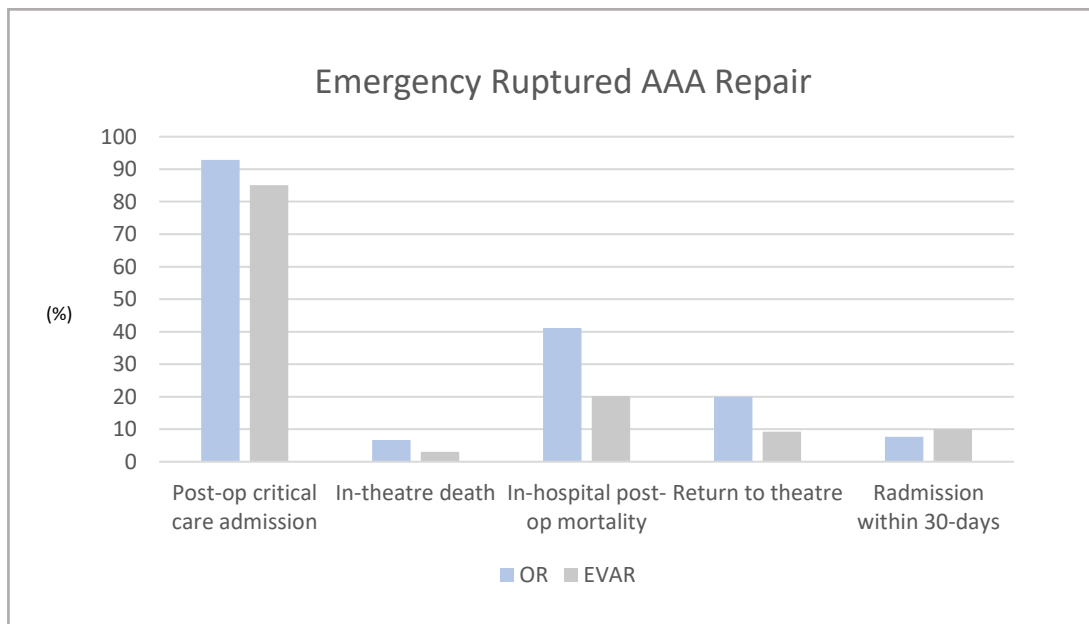
We were able to get further data on anaesthetic technique used. Compared with elective EVAR, less patients had GA alone (46% vs 69%) for emergency EVAR or GA +/- RA/LA (50% vs 75%). This left 50% of patients having LA/RA only for emergency EVARS, compared to only 31% of elective cases.

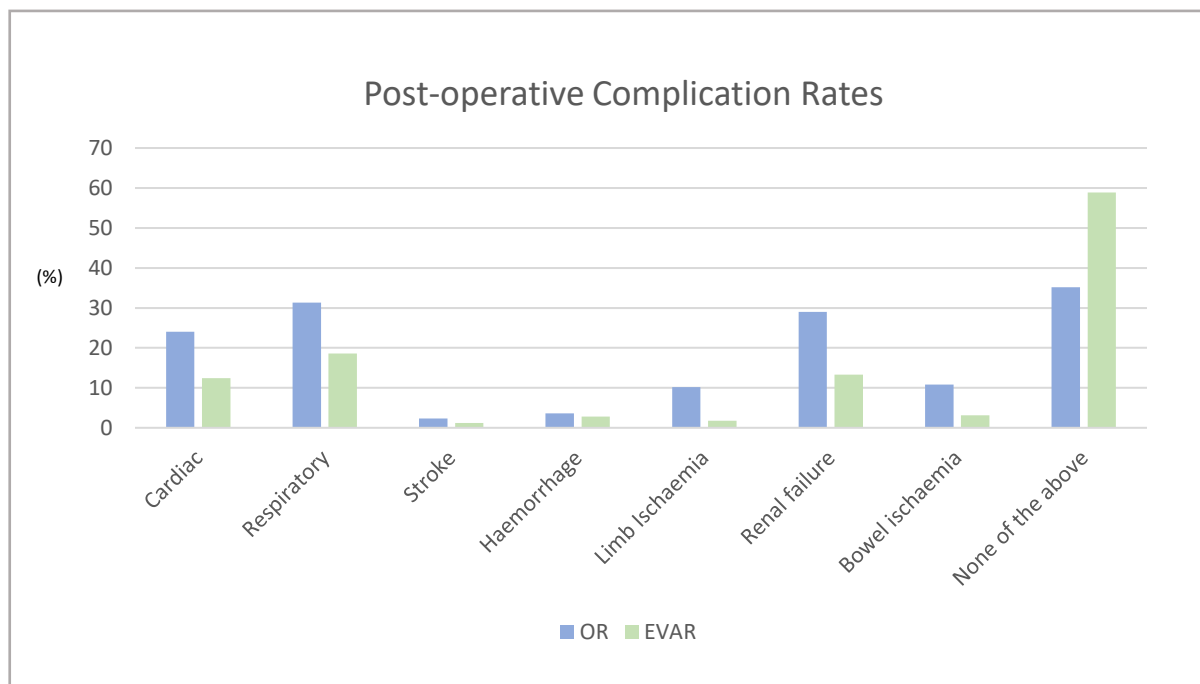
This data has not changed significantly over the last year but maintains a continued trend towards more use of solely LA/RA in the emergency setting. Precise data is not available on precise techniques but these are predominantly categorised as LA cases. Regional blocks are only use in 6% of all cases (sole or combined with GA).

Postoperative details of emergency repairs for ruptured AAAs undertaken between January 2017 and December 2019:

- 1526 open repairs (OR)
- 703 endovascular repairs (EVAR)

The median length of hospital stay, for those discharged alive, was 15 days for OR (IQR 9-24.5) and 9 days for EVAR (IQR 5-15).





Major recommendation:

Improve access to EVAR for emergency AAA via network based pathways, access to hybrid facilities 24/7 and surgical/radiology workforce planning.

Lower Limb Interventions for Peripheral Artery Disease

1) Lower limb bypass

NHS hospitals submitted 18,090 open surgical bypass procedures to the NVR.

- 62.3% were elective procedures and 37.6% were emergency procedures
- Majority of patients were over the age of 60 years presenting for elective and emergency procedures, 64.4% and 68.5% respectively.
- The report did not elude to type of anaesthesia as outlined in the 2018 report
- Most had comorbidities, the commonest being hypertension (68.7%), followed by ischaemic heart disease (34.5%) and diabetes (35%). A small proportion of patients had no comorbid disease (12.2%)
- 81.7% of patients were recorded as being on one anti-platelet agent
- Timing to revascularisation for chronic limb threatening ischaemia:
 - Median wait from admission to surgery was 6 days
 - 49.9% of patients had their bypass within 5 days of admission (the PAD QIF standard)
 - These represent a slight fall off from the last 3 year cycle
- The length of stay was 5 days for elective procedures and 14 days for emergency procedures

- Complications were relatively uncommon: 93.9% of elective and 85.4% of emergency procedures did not require a further unplanned intervention

The In-hospital postoperative mortality rate was 1.8% for elective patients and 4.8% for emergency patients. This rate was higher for emergency procedures where the bypass involved the aorta; 9.3% compared to 3.4% 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) to 2.4% in this cycle.

Again, anaesthetic technique information was extracted. This showed 88% of procedures were done under GA (in whom 77% it was the sole technique). Only 12 % were under LA/RA alone. This is consistent with previous data and numbers are not adequate to show any effect of this on outcome.

Major 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.
- Improved data entry for this group (especially IR cases)

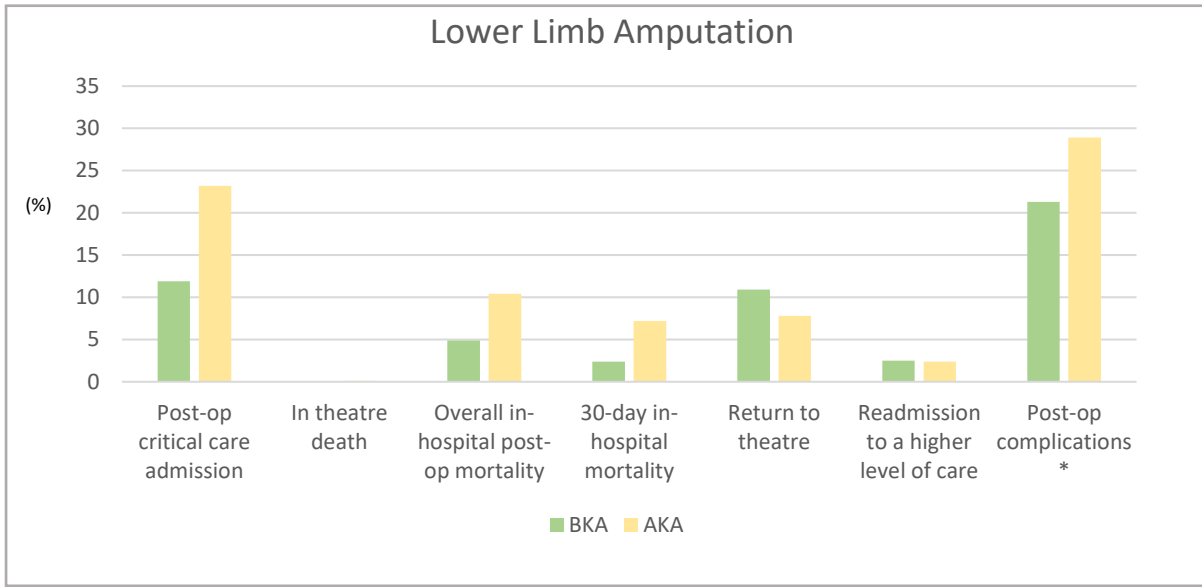
2) Major lower limb amputation

Over the 3-year data collection period, 10,022 major unilateral lower limb amputations were entered into the NVR. Case ascertainment appears relatively low in this group at 81%, which represents an improving trend.

- 51.9 % below-knee amputations (BKA) and 48.1% above-knee amputations (AKA)
- Majority of patients requiring a BKA were diabetic (68.6%), compared to the majority being hypertensive (61.5%) in those requiring an AKA.
- It was common for patients to be on multiple medications, antiplatelet agents and statins being the commonest.
- Oral anticoagulants were taken by 18% of patients (one year data as field added in 2019)
- 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
- Prophylactic antibiotics and DVT prophylaxis were only recorded in 60% of patients (these fields will be made more prominent in future to optimise compliance data).

- 1 in 5 patients suffered a complication following major amputation; these were commonly respiratory (6.4%BKA, 10.3% AKA) and cardiac (4.1% BKA, 6.2% AKA) complications. 10.9 % BKA and 7.8% AKA return to theatre during their admission.

Anaesthetic data showed 72% of procedures were done under GA but a significant number (23%) were combined GA with LA/RA. 28% were under LA/RA alone (a slight increase from 21% last year – future data will be interesting to see if this trend persists). No data on any outcome effect were given.



*Post-op complications include: respiratory, cardiac, limb ischaemia, renal failure, surgical site infection, post-operative confusion, haemorrhage, cerebral, no defined complications

Major Recommendations:

- Vascular units should review local care pathways and patient outcomes for lower limb amputation outlined in the Vascular Society's QIF
- Patients for major amputation should be admitted to a recognised arterial centre via agreed time based protocols
- AKA;BKA ratio should be < 1
- The patient should have routine antibiotic and DVT prophylaxis according to local policy and this should be recorded on NVR

Covid short report

Data was collected from some units for the period between Jan and June 2020. Data is incomplete but does offer useful insights on the impact of Covid-19.

Elective AAA repair was significantly hit in the period March – May, with activity at 12% of that in the previous 3 months.

Emergency care was also hit with Emergency AAA repair at 71% of previous levels and major lower limb amputation at 74%

Further data will follow on the period of recovery and the knock-on demand on services in 2021.

Covid status was collected on emergency patients for AAA or PAD, of whom 2.2% had laboratory confirmed infection. In this group post-operative mortality was higher, especially if a respiratory complication occurred. Mortality Covid -ve and no respiratory complication 2.9% vs 6.1% if Covid +ve. Mortality Covid -ve and respiratory complication 27.9% vs 38.2% if Covid +ve.

Whilst these numbers were small, they are in keeping with other data about the risks of surgery in Covid +ve patients. Overall numbers of operated vascular patients and thus overall excess mortality was modest.

Dr Dan Taylor, Dr Katie Ayyash
VASGBI Research & Audit Committee