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ROULEAUX CLUB ANNUAL ESSAY COMPETITION

Rouleaux Club Winning Essays 2024

The Rouleaux Club run an annual essay competition to help promote interest in vascular surgery. Entrants are asked to write 1,500 words on one of three topics selected by the RC Executive. The essays are marked by the committee and the prizes are awarded to the best essay at the annual Vascular Society meeting. There are two prize categories, one for medical students and another for junior doctors. Below is the winning student essay. The doctor essay was published in May 2025 issue.

STUDENT CATEGORY

Should vascular surgery trainees be allowed to sub-specialise during training?

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Introduction

"The Vascular Surgeon" as a distinct entity, is a novel concept in the UK, only formalising in 2013, with the introduction of the specialty vascular training programme.[1] Following the conventional pathway, it takes a trainee a minimum of 8 years post foundation training to achieve the competencies required to become a vascular consultant.[2,3] Initially encompassed within general surgery, the increased demand and expertise needed for vascular intervention brought about a need for separation.[1] A 20-year predictive study foresaw an increase in vascular procedures of 40.5% over a 20-year period, (2000-2020), with a 5.5.% increase in patients over 65, a group at high risk of vascular disease.[4,5] Between the years 2000-2020 the number of patients requiring vascular surgical intervention were all predicted to show a percentage increase: claudication 35.4%, critical limb ischaemia 44.2%, carotid surgery 34.0%, abdominal aortic aneurysm 40.7%, acute limb ischaemia 45.0% and access surgery 27.4%.[4] Despite the projected increase in vascular procedures,[4] vascular surgery makes up one of the smaller surgical cohorts.[6] Data published by the Royal College of Surgeons showed that in 2022 there were 9,724 consultant surgeons in the UK (Figure 1).[6] Out of this population, there were only 292 vascular consultants and 192 trainees.[6] As with most specialties within the NHS, there is an evident need for more vascular trainees.[7]

The ever-expanding nature of surgery meant that the dawn of independent vascular consultants was inevitably followed by the need for sub-specialisation within vascular surgery. The current system takes a vascular trainee through each aspect of vascular and endovascular surgery.[3,8] Upon completion, a consultant is able to home in on a specific domain within the field should they choose to do so. This includes, but is not limited to trauma surgery, endovascular aortic surgery, access surgery, venous and endo-venous training, thoracic outlet specialist & sarcoma specialist.[9,10] The drive towards sub-specialisation is not unique to the UK, for example 70% of General surgery residents in the United States pursue further specialist training after completion of their general surgery programmes.[11,12] This begs the question, is there a need to delay the commencement of a trainees sub-specialist training & how could early sub-specialisation impact outcomes for patients and doctors?

Figure 1 Number of surgical: consultants, specialist and associate specialist doctor, locally employed doctors in the UK, Arranged by specialty, for 2022. From the Royal College of Surgeons 2023 UK surgical workforce census report.[6]

Specialty	Consultants	SAS / LEDs	Trainees
Cardiothoracic surgery	439	378	169
General surgery	2,715	2,227	2,995
Neurosurgery	386	346	232
Oral and Maxillofacial surgery	343	923	121
Otolaryngology (ENT surgery)	824	615	672
Paediatric surgery	215	143	127
Plastic Surgery	608	422	395
Trauma & Orthopaedics	2,840	2,239	1,899
Urology	1,062	656	669
Vascular surgery	292	122	192
Total	**9,724**	**8,071**	**7,471**

Benefit to the doctor

Examination of the literature shows that early specialisation can lead to perceived improvement in lifestyle, job security, added independence and financial recompense.[11,13,14] Furthermore, there is a growing appetite for surgical trainees to achieve stability earlier in their careers, an eagerness amongst some trainees for the length of training to decrease, and a desire to sub-specialise during training.[6,15,16] Early specialisation could help combat the growing levels of burnout recorded amongst trainees.[15,16] Whilst fears that early differentiation of trainees can lead to an asymmetrical skillset for the future consultants, this may not be entirely the case. A 2002 – 2017 analysis of case logs for 231 orthopaedic trainees found that residents who chose spine surgery (108.4±50.7 vs 74.4±60.2,

p<.01), hand surgery (242.2±92.9 vs 194.3±78.2, p<.01), and sports medicine (278.5±105.8 vs 229.0±93.9, p<.01) performed more procedures in their chosen fields than their colleagues. However, for total joint arthroplasty (p=.18) and foot and ankle surgery (p=.46), there was no significant difference in the number of cases between residents who chose the sub-specialty and those who did not.[17] Whilst this study is limited in its range of specialities analysed, it does indicate that if properly structured, trainees are able to sub-specialise and still retain an appropriate breadth of surgical exposure.

Benefit to the patient

A small study on the effect of a surgeon's seniority and subspeciality interest on mortality, found that surgery carried out by a surgeon without subspeciality interest related to the pathology was associated with a higher risk of postoperative mortality compared with a surgeon with subspeciality interest (OR: 1.38, p<0.00001).[18] A systematic literature review of 22 studies and 144,241 patients found in 91% of cases, specialist surgeons had significantly better outcomes when compared to general surgeons performing the same procedure.[19] This was quantified with a lower mortality rate in 11 of 12 studies (92%), shorter hospital stay in five of five studies and fewer complication rates in 14 of 17 studies (82 %) (Figure 2). This favours the notion that allowing trainees to subspecialise earlier, would increase the pool of effective clinicians best suited to treat specific caseloads. Furthermore, a study into procedural specialisation showed mortality following abdominal aortic aneurysm repairs were lowest when carried out by vascular specialists (2.2%) compared to cardiac (4.0%) and general surgeons (5.5%, p<0.001) (Figure 3).[20] This principle could then be extrapolated further for sub-specialisation within vascular surgery, where a trainee specialising in major trauma will be better suited to deal with, for example, a road-traffic accident, opposed to one focused primarily on endovascular techniques. It appears logical to infer from some literature that earlier sub specialisation could contribute to better patient outcomes.

Figure 2 Histogram Illustrating the effect of specialization on outcome, as measured by overall outcome, mortality, length of hospital stay and complication rate for specialist surgeons compared with general surgeons.[19]

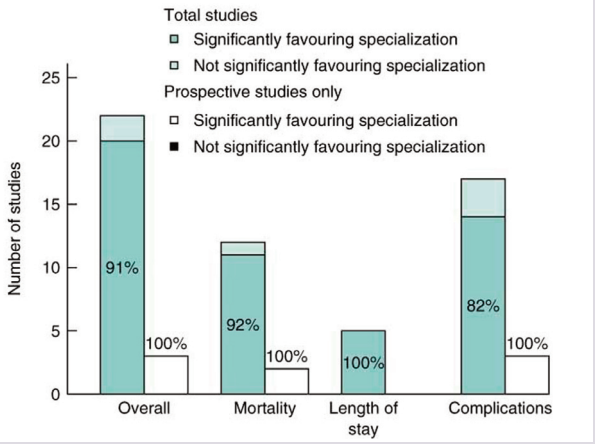
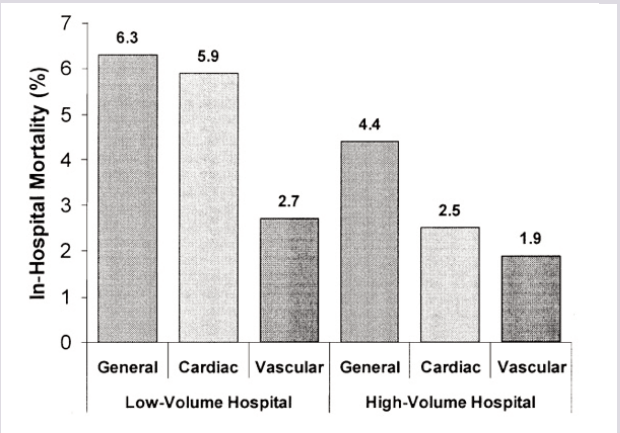


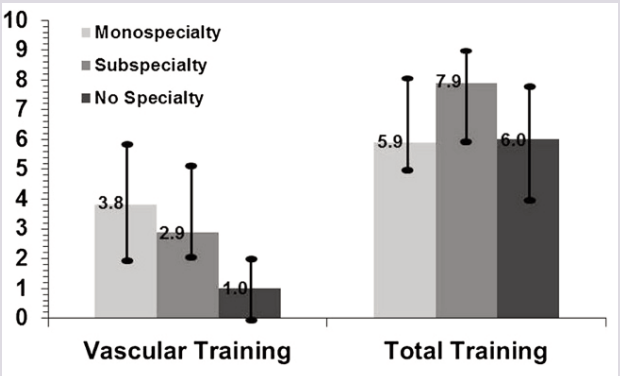
Figure 3 In-hospital mortality according to surgeon specialty at high volume hospitals and low volume hospitals in the United States. Vascular specialisation is associated with significantly lower mortality rate compared with general surgeons at both high volume and low volume hospitals (p < .05). In addition, vascular specialisation is associated with lower mortality compared with general surgeons at high volume hospitals (p < .05).[20]



Negatives to the doctor

It is well established that theatre time amongst trainees has diminished significantly since the start of the 21st century, as much as 50% in some cases, and there is significant variation in the opportunity for trainees to carry out basic procedures.[21–23] While new methods such as simulation – based medical training have shown to help prevent the decay of surgical skills,[21,24] a systematic literature review by Higgins *et al* showed there are currently no substitutes comparable to "time in theatre developing surgical skills".[21] The UK has one of the longest training times for vascular surgeons across Europe,[25] and in instances where vascular surgery is a subspecialty, average training times are almost 2 years longer.[25] Studies also show that countries who view vascular surgery as a sub-specialty, have longer over all training times compared to those who don't (Figure 4).[25] It could be argued that further sub-specialisation would increase the years needed to achieve the necessary core surgical and specialist skills. Increased training time may deter trainees, as years taken to complete training is a key component of dissatisfaction in current doctors within surgery and medicine.[6,15] Continuous sub-specialisation also narrows the working range for doctors, and may lead to them becoming less confident with their basic competencies in areas outside of their established scope of practise.[26] This was one of the factors contributing to vascular surgery becoming distinct from general breast and gastrointestinal surgeons.[1,27]

Figure 4 Mean duration of total years of training is significantly longer for subspecialty certification models compared with mono-specialty (7.9 vs. 5.9 years, p < .001) or no specialty models (7.9 vs. 6.0 years, p = .014).[25]



Negatives to the patient

Over specialisation can lead to de skilling of a surgeons general skills, which may be most acutely felt when providing care for patients in the emergency setting.[28] A recent evaluation of 1554 emergency cases, found 30% of 357 patients requiring complex operations, had their care overseen by a consultant whose sub-speciality did not closely match their case.[28] It should be noted 72% of these cases happened out of hours and only 18% had the consultant scrubbed and in theatre. However, there are already shortages in surgeon numbers,[29–31] and the added complexity of matching suitable specialist trainees and consultants to ambiguous emergency and general cases, could mean more instances of sub-optimal patient care. Looking across medicine we see several articles warning about the devolution of the generalist and enabling early entry into specialist pathways before adequate exposure to a breath of disciplines, can risk inappropriate patient diagnosis and referrals.[32–34] Whilst the association may seem clear, there are limited large scale randomised controlled studies affirming that an increased level of sub specialisation results in improved clinical outcomes.

Conclusion

More research is needed to make conclusive statements about the benefit of early subspecialisation on patient care within vascular surgery. Having explored the potential positives and pitfalls, I believe trainees should be given the option to sub-specialise from the start of training, but not the requirement to. This provides flexibility for trainees who will inevitably differ based on personal circumstance. Most importantly, as with all medicine, the patient should be at the forefront of all decisions made.

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