



Core surgical trainee perspectives on a career in vascular surgery

Early exposure, themed training and a good work-life balance are key to attracting trainees.

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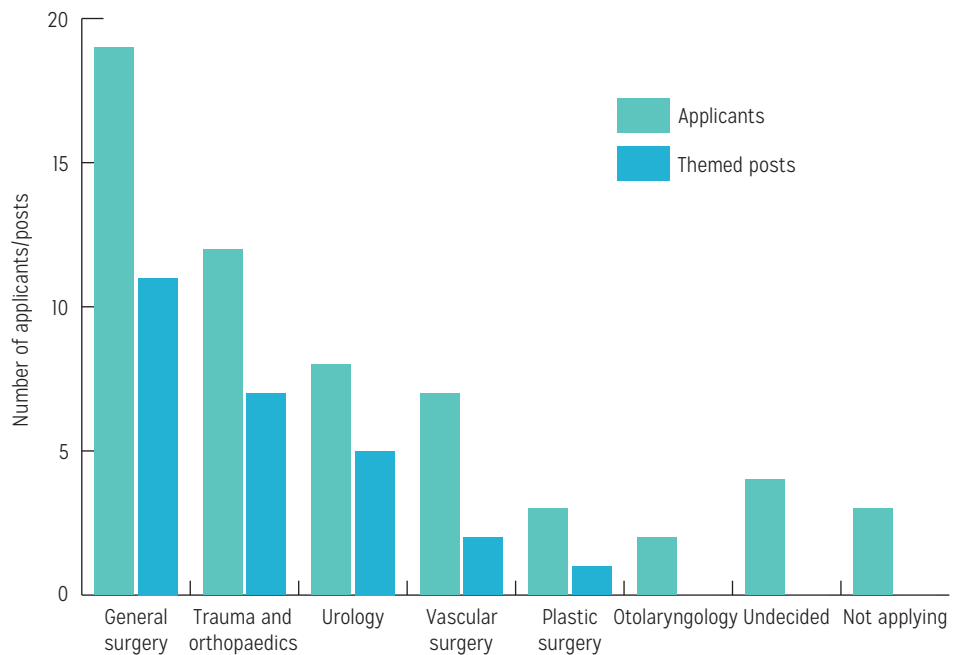
Vascular surgery is one of the smaller surgical specialties, making up about 6% of the UK surgical consultant workforce¹ with 450 practising consultants in the UK in 2014.² Higher surgical training for vascular surgery has undergone significant changes since becoming an independent specialty in 2013. This newly introduced programme has an increased focus on pure vascular surgery exposure and on concurrently developing skills in endovascular procedures. Vascular surgery consultants reported the previous curriculum as inadequate and have welcomed these changes.³

Reported competition ratios are generally high for vascular surgery (13.7 applicants per post in 2013).⁴ Despite this, current recruitment has been unable to fill the 20–26 posts on offer between 2016 and 2018.⁵ These numbers fall short of the recommendation for workforce planning in 2014, which suggested recruitment of 40 trainees per year to cover an increasing demand on services, 7-day working and expected retirements over the next 10 years.⁴

There is limited published research in the UK relating to pursuing vascular surgery as a career. A 2007 study of core trainee perceptions prior to the new programme highlighted factors such as inclusion of endovascular training, no compulsion to undertake research, pure vascular training and a less onerous on-call rota as likely to make core trainees more open to applying to vascular surgery.⁶ Interestingly, many of these concerns have since been addressed with the new 2013 training programme curriculum.⁷

An American study reported that endovascular training has a positive role in career choice alongside mentorship to juniors.⁸ Undergraduate exposure to vascular surgery through lectures and simulation can be influential in developing early knowledge and interest,^{8–10} as well as previous exposure, role models, careers advice and hands-on experience, as shown in other specialties.^{11–14} However, medical students reiterate negative stereotypes associated with surgery (eg such as masculinity, competitiveness, requirement

Figure 1 Numbers of applicants and themed posts per specialty



to sacrifice and intimidating personalities) as a deterrent,¹⁵ with trainees quoting the lifestyle of vascular surgeons as off-putting to trainees.⁷

The aim of this study was to better understand core surgical trainee (CST) perceptions of vascular surgery and influential factors in career choice. The study was designed to identify potential modifiable factors that could be targeted by the vascular surgery community to make it a more appealing specialty to CSTs.

METHODS

The study was a mixed methods study with a sequential exploratory design.¹⁶ The initial part of the study was a set of qualitative, semi-structured interviews to identify key themes. This was followed by a quantitative survey that was developed from thematic analysis of the interviews. The focus of this paper is on the survey part of this study.

Participants for the survey were all CSTs in the Peninsula and Severn deaneries in 2018. Trainees were invited to complete an anonymous online questionnaire (Qualtrics, Provo, UT, US). Consent was implied by completion of the survey.

The survey included questions on basic demographic information, previous

exposure to vascular surgery and future career aspirations. Trainees were asked to rank factors in terms of importance to their choice of future career. Likert scales were used to assess a variety of possible influential factors in career choice as well as perceptions and understanding of a career in vascular surgery.

A chi-squared test was employed to look at associations within categorical data, and to assess representativeness of the sample for male-to-female ratios (goodness of fit) and for applications to specialties. Five-point Likert scales were used to assess possible influential factors and perceptions of vascular surgery. Alongside stacked bar charts of responses, Likert scale scores of 4 (agree) and 5 (strongly agree) were grouped together to represent responses to questions. Comparison of trainee groups (male vs female and exposed vs non-exposed) was performed using a Mann–Whitney U test. A *p*-value of <0.05 was considered statistically significant.

RESULTS

The survey was started by 46 of 94 trainees and completed by 40 trainees, equating to a response ratio of 49% and a completion rate

Figure 2 Influential factors in career choice for core surgical trainees

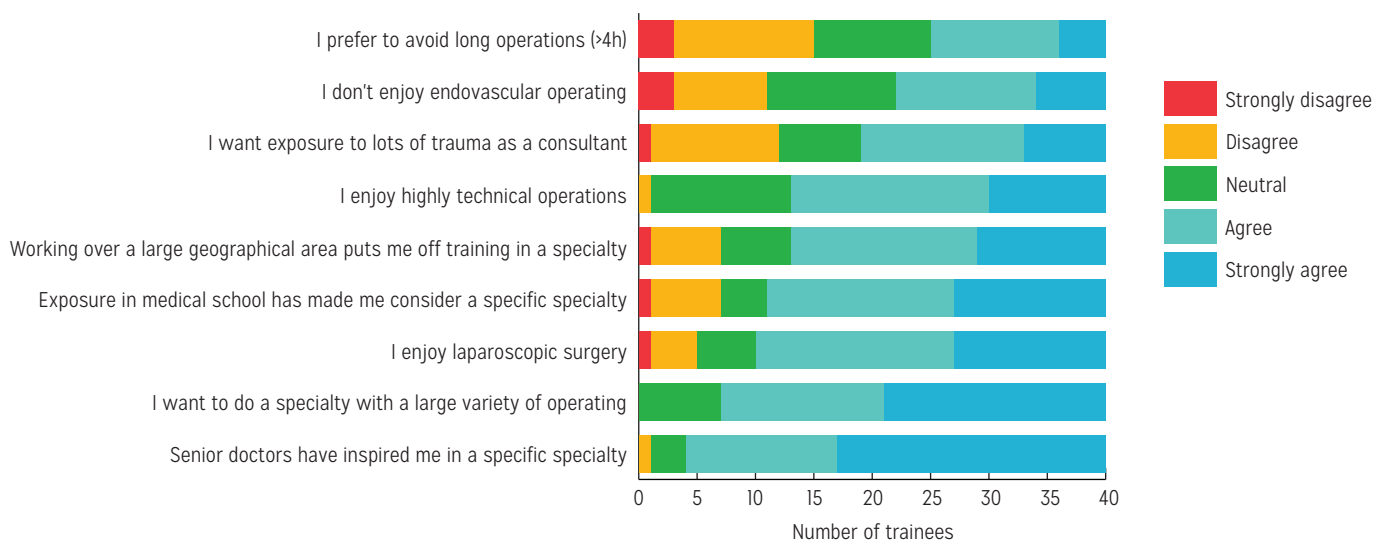
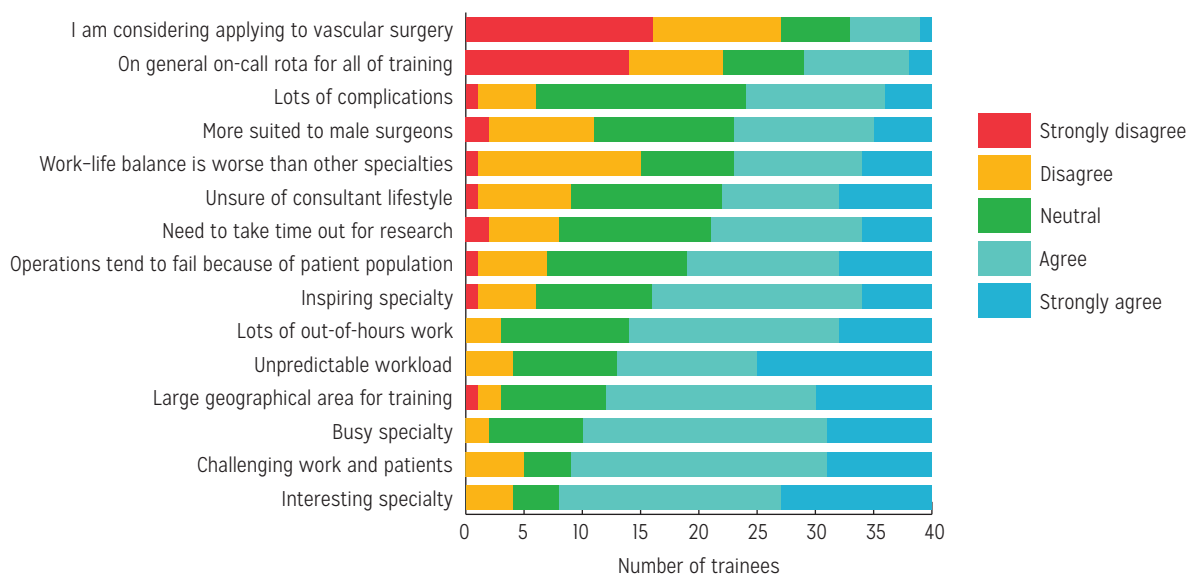


Figure 3 Core surgical trainee perceptions of vascular surgery



of 87%. Over half of the respondents were CT1 trainees ($n=25$, 54%) and male ($n=27$, 59%). There was no significant difference in sex between those eligible to respond and those who completed the survey ($\chi^2=0.42$, $p=0.52$). The majority of the respondents were in a themed training programme ($n=31$, 77%). The most common themes were general surgery ($n=11$), trauma and orthopaedics ($n=7$) and urology ($n=5$) with only two trainees in vascular surgery themed posts (Figure 1).

Exposure and applying to registrar training

Overall, only seven trainees (17%) were considering an application to vascular surgery for registrar training (Figure 1). Almost half of the trainees ($n=19$, 48%) were considering general surgery as their intended specialty after core surgical training; this was followed by trauma and orthopaedics ($n=12$, 21%). Three-quarters of the respondents ($n=30$, 75%) had undertaken a placement in vascular surgery at some point in their medical training (undergraduate or postgraduate) but only half this number ($n=15$, 38%) had experienced a placement as a

CST. Fewer than half of the trainees ($n=17$, 43%) felt they had adequate exposure to vascular surgery to make an informed career decision. Those with previous exposure were significantly more likely to apply for vascular surgery ($\chi^2=4.40$, $p=0.036$).

Over 80% of trainees in themed posts were considering applying to that specialty for higher surgical training, rising to over 95% for trainees in general surgery, trauma and orthopaedics, urology and vascular surgery (Table 1). In this sample, no trainees in themed posts for cardiothoracic, paediatric or plastic surgery were considering

Table 1 Intended specialty for registrar application among trainees in themed posts

Theme of training	Applying as registrar
General surgery (n=10)	9 (90%)
Trauma and orthopaedics (n=5)	5 (100%)
Urology (n=5)	5 (100%)
Vascular surgery (n=2)	2 (100%)
Cardiothoracic surgery (n=2)	0 (0%)
Paediatric surgery (n=1)	0 (0%)
Plastic surgery (n=1)	0 (0%)

Table 2 Mean score when core surgical trainees ranked factors for future career choice from 1 (most important) to 9 (least important)

Influential factor	Mean score
Type of surgery offered by specialty	2.1
Type of team you work with	2.8
Work-life balance	2.9
Continual learning and development	4.2
Patient population	5.5
Availability of private practice	6.3
Ability to do research	6.6
Participation in the general on-call rota	7.0
Consultant with a lot of out-of-hours work	7.6

applying to that specialty. Overall, themed trainees were significantly more likely to apply to that specialty than non-themed trainees in general surgery ($\chi^2=6.95$, $p=0.008$), trauma and orthopaedics ($\chi^2=5.45$, $p=0.020$), urology ($\chi^2=12.38$, $p<0.001$) and vascular surgery ($\chi^2=5.40$, $p=0.020$).

Influences in career choice

The results of the CSTs' ranking of factors influencing career choice are summarised in [Table 2](#). Factors were ranked from 1 (most important) to 9 (least important). The most influential factors were type of surgery offered by specialty (mean score 2.1), type of team you work with (mean score 2.8) and work-life balance (mean score 2.9). There were no significant differences between

Positive influential factors in career choice included an inspirational senior, a large variety of operations and enjoyment of laparoscopic surgery

male and female rankings or between those with and without previous exposure. Both sexes rated type of operating as the most influential and out-of-hours work as the least influential, with male trainees favouring availability of private practice higher than their female counterparts.

Positive influential factors in career choice included an inspirational senior, a large variety of operations and enjoyment of laparoscopic surgery ([Figure 2](#)). Negative factors were large geographical training areas and exposure to trauma cases as a consultant. Respondents tended to disagree that long operations and endovascular surgery would put them off a career choice. Neither sex nor previous exposure made any significant difference to the responses on influential factors.

Perceptions of vascular surgery

With regard to perceptions of vascular surgery, trainees considered it to be interesting (80% agreed), challenging (78%) and busy (75%), with more than half (55%) of the respondents aware that they would come off the general surgery rota ([Figure 3](#)). Trainees also perceived that they would be required to train over a large geographical area (70%), with an unpredictable workload (68%) and lots of out-of-hours work (65%). Fewer than half (43%) of the trainees believed that vascular surgery was more inclined towards male surgeons. Again, as for influences in career choice, neither sex nor previous exposure made any significant difference to the responses on CST perceptions of vascular surgery.

DISCUSSION

This study has confirmed concerns regarding CSTs' consideration of a future career in vascular surgery. Although only 17% of trainees are considering applying to vascular surgery, this is an improvement from 0% shown in a previous study.⁶ Unfortunately, this survey did not enquire whether vascular surgery would be the trainees' first choice for higher surgical training and whether this was their intended career as a consultant. More detailed questioning ('What specialty do you aim to be a consultant in?') may have given more clarity on this. Nevertheless, falling competition ratios are not confined to vascular surgery as applications in general surgery fell from 4.8:1 in 2011¹⁷ to 1.48:1 in 2017.¹⁸

It is of little surprise that trainees with no previous placements in the specialty were not considering an application to vascular surgery. Potential ways to improve exposure earlier in trainees' careers include targeting surgical societies, and encouraging medical students and foundation doctors to participate in vascular surgery training courses and conferences. This has been successful in other specialties.¹¹⁻¹⁴ These types of courses are more prevalent now and are offered by the Association of Surgeons in Training, the Rouleaux Club (vascular trainees' society) and the Vascular Society.^{19,20} Developing medical student taster sessions, essay competitions (as already offered by the Rouleaux Club) or student selected component modules for medical schools could also offer opportunities in medical school for students with an interest in the specialty. Early exposure has been

successful in other specialties.

Themed training is perceived as improving the chances of appointment to ST3, with UK research supporting more themed surgical training posts than uncoupled ones.²¹ Promoting and expanding the numbers of themed posts may attract applications to higher surgical training but it is unclear what the current uptake and availability of these vascular themed posts is nationally. The introduction of the Improving Surgical Training initiative, which includes vascular surgery in its pilot, will offer another route into the specialty. These posts will offer better on-call frequency (up to 1:10), protected supervision time and focused training.²² It will be interesting to track the uptake of these posts and the progress of trainees who take this route of training.

Work-life balance and quality of life are increasingly important in junior doctors' future career choice,²³ with vascular surgery reported as leading to a lifestyle that deters potential applicants.⁷ Some features of the vascular surgery workload (such as the patient population and variety of surgical procedures) are unlikely to change significantly in the future. However, by balancing on-call shifts with days off and increasing the consultant workforce to reduce on-call frequency and daily workload, vascular surgery could be made more appealing as a whole.

Given that 36% of surgical trainees move five times or more and 8% move ten times or more across training, limiting posts to commutable locations or lengthening placements in one hospital may be a beneficial adjustment to attract trainees, and improve their overall mental and physical wellbeing.²⁴ This study was conducted over one of the larger geographical areas for training in vascular surgery but expanding the survey nationwide may give a different view.

CONCLUSIONS

Vascular surgery is facing challenging times in recruitment, with a shortfall in applications to the specialty. This study has

highlighted that this specialty currently leads to a lifestyle that many trainees do not want. It has also demonstrated the importance of increasing exposure of junior trainees to the specialty, and that the specialty needs to consider ways to improve the working conditions for trainees and consultants.

References

- Royal College of Surgeons of England. Surgery and the NHS in numbers. www.rcseng.ac.uk/news-and-events/media-centre/media-background-briefings-and-statistics/surgery-and-the-nhs-in-numbers/ (cited January 2020).
- Harkin DW, Beard JD, Shearman CP, Wyatt MG. The vascular surgery workforce: a survey of consultant vascular surgeons in the UK, 2014. *Eur J Vasc Endovasc Surg* 2015; **49**: 448-454.
- Harrison GJ, Vohra RK. Vascular and endovascular training in Great Britain and Ireland. *Ann R Coll Surg Engl (Suppl)* 2015; **96**: 56-58.
- Vascular Society. *Vascular Surgery UK Workforce Report 2014*. London: Vascular Society; 2014.
- Boyle J. Presented at: Annual Scientific Meeting of the Vascular Society; 23 November 2017; Manchester.
- Currie S, Coughlin PA, Bhasker S *et al*. Vascular surgery is an unattractive career option for current basic surgical trainees: a regional perspective. *Ann R Coll Surg Engl* 2007; **89**: 792-795.
- Callagaro KD, Dougherty MJ, Sidawy AN, Cronenwett JL. Choice of vascular surgery as a specialty: survey of vascular surgery residents, general surgery chief residents, and medical students at hospitals with vascular surgery training programs. *J Vasc Surg* 2004; **40**: 978-984.
- Godshall CJ, Moore PS, Fleming SH *et al*. A vascular disease educational program in the preclinical years of medical school increases student interest in vascular disease. *J Vasc Surg* 2010; **52**: 775-780.
- Singh N, Causey W, Brounts L *et al*. Vascular surgery knowledge and exposure obtained during medical school and the potential impact on career decisions. *J Vasc Surg* 2010; **51**: 252-258.
- Sutton PA, Mason J, Vimalachandran D, McNally S. Attitudes, motivators, and barriers to a career in surgery: a national study of UK undergraduate medical students. *J Surg Educ* 2014; **71**: 662-667.
- Alberti H, Randles HL, Harding A, McKinley RK. Exposure of undergraduates to authentic GP teaching and subsequent entry to GP training: a quantitative study of UK medical schools. *Br J Gen Pract* 2017; **67**: e248-e252
- Dunkley L, Filer A, Speden D *et al*. Why do we choose rheumatology? Implications for future recruitment - results of the 2006 UK Trainee Survey. *Rheumatology* 2008; **47**: 901-906.
- Haggerty KA, Beaty CA, George TJ *et al*. Increased exposure improves recruitment: early results of a program designed to attract medical students into surgical careers. *Ann Thorac Surg* 2014; **97**: 2111-2114.
- Tay J, Siddiq T, Atiomo W. Future recruitment into obstetrics and gynaecology: factors affecting early career choice. *J Obstet Gynaecol* 2009; **29**: 369-372.
- Hill EJ, Bowman KA, Stalmeijer RE *et al*. Can I cut it? Medical students' perceptions of surgeons and surgical careers. *Am J Surg* 2014; **208**: 860-867.
- Creswell JW, Plano Clark VL, Gutmann ML, Hanson WE. Advanced Mixed Methods Research Designs. In: Tashakkori A, Teddlie C. *Handbook of Mixed Methods in Social and Behavioral Research*. Thousand Oaks, CA: Sage; 2003. pp209-240.
- Health Education England. Training and development (general surgery). www.healthcareers.nhs.uk/explore-roles/doctors/roles-doctors/surgery/general-surgery/training-and-development (cited January 2020).
- Health Education England. Competition ratios. <https://specialtytraining.hee.nhs.uk/Competition-Ratios> (cited January 2020).
- Association of Surgeons in Training. The ASiT International Surgical Conference 2020. www.asit.org/events/asit-international-surgical-conference-2020/ evt1390 (cited January 2020).
- Vascular Society. An Introduction to Vascular Surgery course. www.vascularsociety.org.uk/professionals/events/1265/an_introduction_to_vascular_surgery_course (cited January 2020).
- Abdelrahman T, Thomas C, Iorweth A *et al*. Core surgical training outcome in Wales. *Ann R Coll Surg Engl (Suppl)* 2016; **98**: 456-459.
- Royal College of Surgeons of England. *Improving Surgical Training*. London: RCS; 2015.
- British Medical Association. *Understanding Trends Among Current Doctors in Training*. London: BMA; 2018.
- O'Callaghan JM, Mohan HM, Harries RL. The non-monetary costs of surgical training. *Ann R Coll Surg Engl (Suppl)* 2018; **100**: 339-344.