World Journal of Surgery and Surgical Research

Research Article
Published: 30 Jul, 2020

Endocrine Surgery Training in the United Kingdom: A Survey of Higher Surgical Trainees

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Abstract

Aim: To analyze the current perceptions of higher surgical trainees in the United Kingdom regarding individual exposure and experience in endocrine surgery.

Methods: A web-based questionnaire was distributed amongst higher general surgical trainees in the UK, inquiring about their current exposure and the expected numbers of procedures performed by the end of their training.

Results: The questionnaire was returned by 131 higher surgical trainees. While the numbers for thyroid [range: 1 to 40] - and parathyroid [range: 1 to 30] procedures performed were variable, the exposure to laparoscopic/open adrenalectomy or neck dissections was poor (overall <10 cases performed during training). Overall, trainees felt their current exposure to fall short of the numbers they considered needed for reaching competency. After excluding those trainees with no prior experience in endocrine surgery, over 95% of responders (*n*=88/91; 96.7%) felt that indicative numbers should be set, to guide them in their training. Furthermore, overall 120 of the responders (91.6%) felt a fellowship in endocrine surgeon was necessary to obtain the required skills.

Conclusion: This survey showed that trainees expressed a desire for establishing indicative numbers of endocrine operations to have been performed by the end of their surgical training, albeit no guidance towards the exact numbers for achieving competences could be set. Moreover, the role of designated endocrine surgery fellowships seemed to be broadly supported and therefore high-volume centers should be encouraged to offer such opportunities.

Keywords: Endocrine Surgery; Training; Survey

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Received Date: *17 Jun 2020*
Accepted Date*: 28 Jul 2020*
Published Date*: 30 Jul 2020*

Citation:
de Jong MC, Christakis I, Mihai R, Khan S. Endocrine Surgery Training in the United Kingdom: A Survey of Higher Surgical Trainees. World J Surg Surgical Res. 2020; 3: 1240.

Introduction

The landscape of surgical training in the United Kingdom (UK) has changed vastly over the last decades. The end of the Calman-era of training and the introduction of the 'modernizing medical careers' era meant an overturning of the curriculum and of the method by which it is delivered. The introduction of the European Working time directive reduced hours of working to 58 h in 2004, 56 in 2007 and then again to 48 in 2009. Whilst this heralded more 'hospitable' training, there can be no doubt that this reduction in hours impacted upon surgical training [1]. Surgical training has always been looked at as an apprenticeship and the reduction in the hours of work meant reduced exposure to patients and ultimately a reduction in experience [2-5].

Historically, endocrine surgery in the UK has largely been seen as a secondary subspecialty, encompassed in general surgery and usually coupled with other subspecialties such as breast or vascular surgery. Currently, it is recognized as an option for the final Fellowship of the Royal Colleges of Surgeons (FRCS) examination, with curriculum and standards defined within the Intercollegiate Surgical Curriculum program [6]. Surgeons with a 'pure endocrine' practice exist mainly in large tertiary centers and the overall service delivery of endocrine surgery is under constant transformation in the UK, as it is in most countries. Thyroid and parathyroid operations are increasingly being performed by ENT surgeons in the UK, as shown by the British Association of Endocrine and Thyroid Surgery (BAETS) databases year on year [7]. Adrenalectomies are even more difficult to map in terms of the subspecialty of the operating surgeon, as allegedly a significant number of cases are done by general surgeons and urologists who are not members of BAETS and hence do not submit their cases to the national audit [8].

Volume-outcome correlations have been shown in several fields such as general and urological

Table 1: Questions of the web-based questionnaire.

Q1. What year of training are you currently in?
Q2. How many of each endocrine operation have you performed?
Q3. How many of each endocrine operation do you need to perform by the end of higher surgical training? Please leave blank if you don't feel you have the experience to answer.
Q4. Do you see a need for Endocrine Surgeons to be trained in ultrasound of thyroid +/- FNA?
Q5. Do you think the Royal College of Surgeon giving indicative number that you need to perform would be useful as in with other specialties?
Q6. Do you feel a Trainee Endocrine Surgery group would be helpful to the specialty such as Duke's club, Mammary Fold etc?
Q7. Do you think a Fellowship in Endocrine Surgery would be needed to be an endocrine surgeon?
Q8. Would you be interested in attending live operating workshops for thyroid/parathyroid/adrenal operations?
Q9. Would you be interested in the development of simulator-based training for neck/adrenal surgery as an aid to gaining experience?
Q10 Please ranks the most important factors from 1 (least important) to 5 (most important) that limits training in endocrine surgery:
• Lack of exposure to numbers of cases
• Lack of exposure to complex cases
• Lack of experience as first person operating
• Lack of focused educational courses
• Limited emphasis in current FRCS syllabus

surgery [9-11]. The concept that surgeons and units with high workload should have better outcomes is easy to grasp, but it remains difficult to address the issue of persistent low-volume surgeons. This has been extensively discussed during the 2019 meeting of the European Society of Endocrine Surgeons (ESES) who has formulated guidelines for service delivery, training and accreditation of endocrine units [12]. In this context, it is therefore surprising is that the current UK curriculum gives no guidelines or indicative numbers with regards to numbers of operations needed to be performed by endocrine surgeons [13].

The aim of this study was to assess the views of current UK trainees within recognized training programs, regarding their exposure to endocrine operations and their perception of numbers needed to be proficient as an independent practitioner at consultant level.

Methods

A web-based questionnaire was devised (Table 1) and sent out to all training program directors for general surgery in the UK, with the request to disseminate the questionnaire to their trainees. To further increase the response rate, the main author also attended the Associations of Surgeons in Training (ASiT) and the Association of Surgeons Great Britain and Ireland (ASGBI) conferences in 2019 and asked directly trainees to fill in the questionnaire.

The annual number of endocrine operations performed in the UK was analyzed using the Hospital Episode Statistics (HES) database [14].

Results

The annual number of endocrine operations performed in the UK is shown in Table 2. There was an increase, year on year, in the number of thyroidectomies, parathyroidectomies and adrenalectomies being carried out in the UK over the last 5 years.

Replies to the web-based questionnaire were received from 131 higher surgical trainees (Figure 1), and with variable personal experience in endocrine surgery (Figure 2). There was a wide variation of numbers of thyroidectomies performed, with the majority of trainees having undertaken anything from 1 to 40 (*n*=92; 70.2%). Parathyroid experience were smaller numbers, being concentrated around 1 to 30 cases (*n*=86; 65.6%).

Table 2: Annual number of endocrine operations performed in the UK.

	2017/18	2016/17	2015/16	2014/15	2013/14
Thyroidectomies	14,976	14,975	14,056	13,062	13,547
Parathyroidectomies	4615	4411	4096	4137	3969
Adrenalectomies	879	825	810	768	774

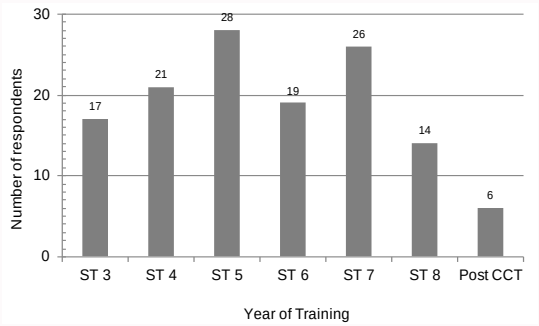

Figure 1: Years of training of included trainees (*n*=131).

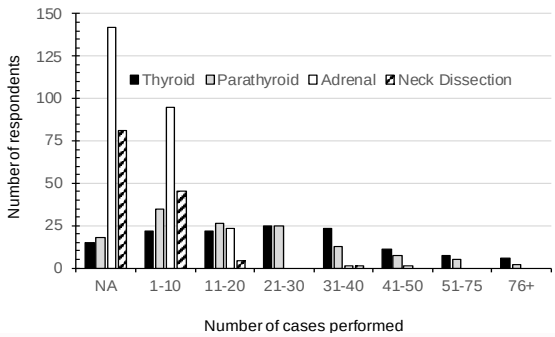

Figure 2: Number of each procedure trainees had performed at time of survey (*n*=131).

The data on adrenal procedures showed that a third of respondents had not seen a laparoscopic adrenalectomy and that those who had, had seen less than 10 (*n*=52; 39.7%). Similar numbers are seen for

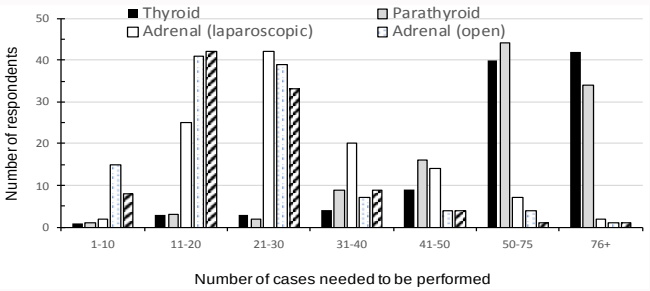

Figure 3: Number of operations trainees felt were required before the end of training to be considered competent (*n*=91).

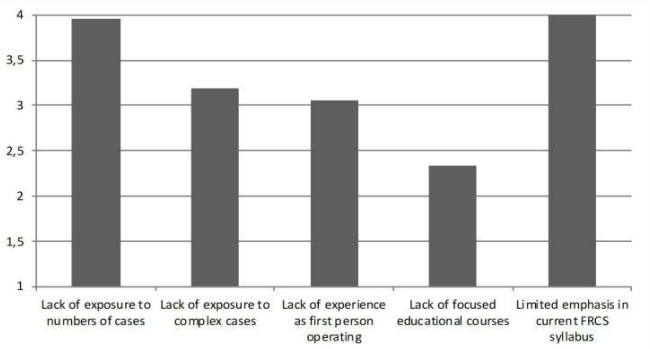

Figure 4: Evaluation of certain restraints on training by ranking on a Likert scale (i.e. score of 1-5 with 1 being the least important and 5 being the most) (*n*=91).

open adrenalectomies, with even larger proportions (*n*=84; 64.1%) having had no experience of the procedure.

When looking at neck dissections for thyroid lymph node disease, data showed that most respondents (*n*=81; 61.8%) had zero experience. Only 49 trainees (37.4%) declared to have had some experience with this procedure, with the majority of these having performed less than 10 (*n*=45; 91.8%) and four respondents (8.2%) having performed up to 20.

One section of the questionnaire enquired about the expected numbers of cases the trainees felt they would need to achieve their Certificate of Completion of Training (CCT). Those who declared no experience in these operations were removed from this section of results (total included for analysis: *n*=91; 69.5%). The results from Figure 3 show a large proportion of the trainees felt that ≥ 50 to 76 thyroid- and parathyroid-procedures were an appropriate number. For laparoscopic adrenalectomy, the majority of trainees felt that between 11 to 30 would be an appropriate number (*n*=48; 52.8%), with a slight predominance toward the top end of that range. Although the data was similar for open adrenalectomy (number of procedures required: 11-30 (*n*=57; 63.0%)), this skewed nearer the lower end. Moreover, neck dissections were felt to require a similar number to achieve competence at CCT at 11 to 30 (*n*=57; 63.0%).

Upon asking whether Endocrine Surgeons should be trained in performing ultrasounds of the thyroid and US guided FNA (*n*=91), two-thirds (*n*=59; 64.8%) felt this would be a useful tool to be proficient with, while one-third (*n*=27; 29.7%) felt it was better left to a radiologist as these would have more expertise. A very small number gave no response accounting for some missing data (*n*=5; 5.5%).

When asked about the need for indicative numbers for their CCT, an overwhelming majority felt this was required. Over 95% of all responders with (*n*=88; 96.7%) felt that the Royal College of Surgeons giving a guide, would help trainees have an idea of what pre-requisites for end of training.

Trainees were then asked to evaluate certain restraints on training by ranking them on a Likert scale (i.e. score of 1 to 5 with 1 being the least important and 5 being the most). The results (Figure 4) show the distribution of scores with limited emphasis in the current syllabus and lack of exposure to volume of cases scoring highest.

When the entire cohort was asked if a trainee group for the specialty would help, 121 (92.4%) felt that there was merit in it. Fellowships were discussed, and 120 of the responders (91.6%) felt this was needed to be an endocrine surgeon. Next, questions about interest in attending live operating workshops for endocrine cases were asked. The responses were in favor of attending these, with 113 (86.3%) showing an interest. The same number of responders was in favor of simulator-based training, as an adjunct to meet the needs of the specialty.

Discussion

Interest in endocrine training has increased over the last few years, with it becoming recognized as a specialty in its own right, rather than a secondary specialty. In the UK, a total of 20,470 endocrine procedures were performed in 2017/18 and these numbers demonstrate a year on year increase in case-load. This may be due to improved diagnostic capabilities, a growing population or perhaps an aging population. Trainees have clearly asked for more guidance in respect to indicative numbers of operations needed for completion of training. Whilst it must be borne in mind that absolute numbers are not a 'barometer' of operative acumen, they provide a good surrogate marker. This must be combined with a structured training program and teaching from recognized fellowships to reach suitable numbers and knowledge of the disease by way of mentorship.

It seems reasonable therefore that endocrine surgery should be offered and treated the same way as all subspecialties in the UK, in terms of curriculum, learning and indicative numbers.

Association of volume of surgery and outcome has been well documented and it seems a small step to assume that increase in exposure leads to better training. However, reduction in working hours among trainee surgeons has diminished with the working time directives. Surgery has long been seen as an apprenticeship and with decreasing time spent exposed to patients and their illnesses, we could become less experienced. Practical skills, such as time spent operating, have reduced greatly by CCT [4,15,16] but expectation from the public is nonetheless increasing. Volumes of surgery and outcome are now published through the BAETS website for public and peer scrutiny.

We need methods to counter the reduction in operative time/experience, which can be undertaken as an adjunct to learning and training. One option could be the use of simulators. Simulator based training has seen a massive rise in popularity over the last few years – mainly due to advancing technology, but also a need to practice techniques. The old adage of 'see one, do one, teach one' seems to have been replaced by 'see one, simulate many, do one'. Some have argued that simulators are just not advanced enough to have acceptable results, but there does seem to be evidence to compliment it as an adjunct to surgery. The question of whether the skills acquired during

simulation-training are transferrable to the operating table seems also to show positive results [17]. Simulator based training has become increasingly popular in the United Stated, with the Mayo Clinic (Rochester) encouraging residents to undertake simulator sessions during their general surgery trainings, designed to deliberate practice and pre-emptive learning [18,19]. These modules include training on thyroidectomy, parathyroidectomy and adrenalectomy.

The number of surgeons performing their own diagnostic ultrasound scans has increased with publications showing its utility, particularly in the United States. Whilst the current survey showed some interest in performing ultrasound scans for thyroid nodules, a modest number still felt it was better left to radiologists. A few respondents raised concerns about the Medicolegal aspects of surgeons performing the ultrasound scan. Nonetheless, there does seem to be a reasonable cohort of trainees keen to expand their skill set. Multiple courses are available in the UK for surgeons to become familiar with ultrasound scans of the neck and perhaps this is something that can be integrated into endocrine training at a more senior level of training.

An important point from the survey is that trainees have voiced their desire to have more guidance from our Royal College, with regards to indicative number of procedures to be performed by the end of training. Currently, the Royal College already offers such indicative numbers to all other subspecialties. These allow trainees to direct their training and have a clearer idea of what is required of them. These numbers will also help trainers in what is expected of their pupils. Guidance on this topic can be derived from the recommended minimal operative experience necessary to be eligible for the European Board of Surgery Qualification in Endocrine and Neck Endocrine Surgery as defined by the Division of Endocrine Surgery, UEMS: Thyroid resections: 50 performed and 50 assisted, for lateral compartment lymph node clearance: Two performed + 10 assisted, for parathyroidectomy: 15 performed and 20 assisted and for adrenalectomy: Two performed and 10 assisted [12].

Trainees overwhelmingly supported the role of fellowships in endocrine surgery. Fellowships allow trainees who are toward the end of their training to spend a dedicated period of time in their chosen specialty. It allows them to train in a recognized centre and increase expertise *via* 'learned trainers' with exposure to more operations than in their usual training system. With the current trends in registrar training, it seems more and more trainees are inclined to undertake a fellowship in order to gain the experiences needed to become a consultant. The ESES guidance on this topic has stated that fellowship training in endocrine surgery should be performed in units that perform a minimum of 100 thyroid, 50 parathyroid, 15 adrenal, and/or 10 Gastroenteropancreatic Neuroendocrine Tumors (GEP-NET) operations yearly [12]. Such fellowships of 1 to 2 years are a recommended part of the postgraduate training for those who intend to specialize in Endocrine Surgery. Fellows should be expected to have been the primary surgeon in a minimum of 50 thyroid operations, 10 (central or lateral) lymph node dissections, 15 parathyroidectomies, five adrenalectomies and five GEP-NET operations. The fellows are to be encouraged to be examined on the national or European level [12].

Trainee groups have been a more recent development over the previous two decades. Groups of differing subspecialties have emerged throughout the UK, in order to improve the training experience of its trainees as well as to provide a forum for discussion amongst the similar minded. Endocrine Surgery seems to be one of the last subspecialties to offer a trainee group and perhaps this is a contributing factor as to why it remains under-represented. Trainees have stated they would very much be in favor of a trainee group for endocrine surgery, which may help publicize the specialty further.

Workshops and observing live operating have gained popularity in recent years. They allow yet another platform by which surgeons can observe and be trained in structured environments. This is not limited to trainees as it can also aid the more experienced – particularly when it comes to operations that are not carried out frequently such as adrenalectomies. In an era where 'Get It Right First Time' has come to prominence, perhaps we should look to each other and standardize approaches and integrate more with each other - after all, learning does not end once consultant status is attained.

There are certain limitations to the current study. Firstly, it is an entirely voluntary web-based study. Participation from registrars was requested and a modest number of replies were obtained. As replies from trainees at all levels were obtained, it could potentially be that some of the more junior members may not have fully appreciated the number of cases needed to achieve a specific competence. Certain comments reflected this limitation, as some trainees did not answer particular questions as they felt they were not best informed to do so. Our study has also included trainees across general surgery and not just Endocrine Surgeons. This, again, meant that some of the data may not be fully applicable to endocrine surgery; although we do feel there should be enough cross-over that the information gathered has validity.

In conclusion, currently, endocrine surgery is the only subspecialty within the UK that does not offer indicative numbers of operations which should have been performed by the end of surgical training, although this survey among trainees does indicate a desire for these data. However, more diligence is needed to set these specific numbers and, perhaps, a next step could be to ask endocrine surgical trainers what their ideas of acceptable numbers to achieve competence are. Moreover, the role of fellowships within the field of endocrine surgery seems to be broadly supported and high-volume centers should be identified to offer these opportunities to those who wish to pursue a career as endocrine surgeons.

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