

Trends in UK endoscopy training in the BSG Trainees' National Survey and strategic planning for the future

Sujata Biswas¹, Laith Alrubaiy², Louise China³ on behalf of the British Society of Gastroenterology Trainees' Section, Melanie Lockett⁴, Antony Ellis¹, Neil Hawkes⁵

Affiliations

1. Translational Gastroenterology Unit, Oxford University Hospitals NHS Foundation Trust
2. Swansea University Medical School, Swansea, UK
3. Division of Medicine, University College London, UK
4. North Bristol NHS Trust
5. Royal Glamorgan Hospital, Llantrisant, UK

Abstract

Background: Improvements in the structure of endoscopy training programmes resulting in certification from the Joint Advisory Group in Gastrointestinal Endoscopy (JAG) have been acknowledged to improve training experience and contribute to enhanced colonoscopy performance.

Objectives: The 2016 British Society of Gastroenterology (BSG) Trainees' survey of endoscopy training explored the delivery of endoscopy training – access to lists; level of supervision and trainee's progression through diagnostic, core therapy and sub-specialty training. In addition, the barriers to endoscopy training progress and utility of training tools were examined.

Methods: A web-based survey (Survey Monkey™) was sent to all higher specialty Gastroenterology trainees.

Results: There were some improvements in relation to earlier surveys; 85% of trainees were satisfied with the level of supervision of their training. But there were ongoing problems; 12.5% of trainees had no access to a regular training list, and 53% of final year trainees had yet to achieve full certification in colonoscopy. 9% of final year trainees did not feel confident in endoscopic management of upper GI bleeds.

Conclusions: The survey findings provide a challenge to those agencies tasked with supporting endoscopy training in the UK. Acknowledging the findings of the survey, the paper provides a strategic response with reference to increased service pressures, reduced overall training time in specialty training programmes and the requirement to support general medical and surgical on-call commitments. It describes the steps required to improve training on the ground: delivering additional training tools and learning resources, and introducing certification standards for therapeutic modalities in parallel with goals for improving the quality of endoscopy in the UK.

Summary Box

What is already known about this subject?

UK Gastroenterology trainees have previously reported difficulty achieving endoscopy certification and 1 in 5 reported dissatisfaction with their endoscopy training

What are the new findings?

The 2016 BSG National Endoscopy Training survey shows a lack of improvement in several areas, in particular access to training lists with appropriate caseload and experience in therapy for upper GI bleeding

How might it impact on clinical practice in the foreseeable future?

A strategic approach has been outlined together with JAG to overcome the problems identified amongst trainees

Introduction

Endoscopy is a complex skill requiring the acquisition of technical handling skills and knowledge of key concepts and principles. Different endoscopic procedures are associated with unique profiles to their learning curve requiring training programme directors (TPDs) to evaluate the effectiveness of different training elements (1-3) in the context of varying models of gastroenterology training (4, 5). In the past 15 years gastrointestinal (GI) endoscopy training in the UK has seen significant change. The traditional hands-on apprenticeship model has evolved into a competency-based training programme. Evidence based training elements at key milestones of the procedural learning curve increase opportunities for feedback and deliberate practice (6,7). The aim is to optimise learning of both the cognitive and technical skills required by endoscopists through the utilisation of e-learning, simulation and specific skills courses run by the Joint Advisory Group in GI Endoscopy (JAG) Regional Training Centres, in addition to hands-on training (8-15). This blended approach to complex skills training has been validated for training laparoscopic procedures (16-19). The certification standards set by the JAG define the performance level required by trainees. Training is supported by validated tools to measure global performance – the direct observation of procedural skills (DOPS) assessment tool (20,21) is one of a range of metrics being developed to assess competency in endoscopy (22,23). The introduction of a dedicated electronic portfolio for endoscopy trainees, the JETS (JAG Endoscopy Training System) e-portfolio, collates

evidence of training, the analysis of which has allowed a better understanding of the learning curves of diagnostic endoscopy (24,25).

UK Gastroenterology and GI surgery trainees complete their endoscopy training within the context of a Specialty Training Programme overseen by Postgraduate Deaneries. Both extend over a 5-year period but specialty training time may be reduced in the wake of the Shape of Training report (26). UK trainees also contribute to general medical and surgical services with on-call duties out-of-hours which can erode significantly into endoscopic training time (27).

Surveys of trainee groups give useful insights into how training is being delivered on the ground. Previous reports from the UK have described difficulty in accessing training opportunities (especially in the management of acute GI bleeding), difficulties in achieving certification standards within the confines of existing training programmes, and that approximately 1 in 5 trainees felt dissatisfied with their overall endoscopy training (28-33). In February 2016 the British Society of Gastroenterology (BSG) Trainees' Section conducted a further national online survey, focusing on aspects of endoscopy training, to provide an updated view of the state of endoscopy training across the UK, with additional questions evaluating potential causative factors to previously reported trends. The aim was to use this information to facilitate improvements to national endoscopy training programmes.

Methods

A web-based survey (Survey Monkey™) was designed and an invitation to complete the survey was sent to all higher specialty Gastroenterology trainees in the UK using BSG and established trainee databases. The design required that all questions needed to be answered to progress to completion of the survey. An initial version was piloted for ease of use. Questions related to the experience of endoscopic training during the given academic year, from September 2015 to the time the survey was taken in March 2016. The survey was open to respondents for a period of one month with reminders sent to all potential participants. Data were collated and analysed using Microsoft Excel™.

Survey results

281 out of a total of 819 trainees (current BSG registered trainees) responded to the survey. All training grades and all deaneries were well represented (Figure 1). 37% of survey respondents were female, reflective of the 39% of Specialty Trainees in Gastroenterology in the UK who are female (34). Trainees were equally divided between District General Hospitals (DGHs) and Tertiary Centres. Senior trainees were considered to be those in their final two years of training (ST6 and ST7), comprising 34% (95/281) of all responders.

The key findings of the survey are summarised in Box 1. Further details are presented in five main sections – training lists; progression of basic training; supervision, assessment and recording of training; therapeutic and sub-specialty training, and barriers to training.

Training lists

Access to training lists amongst the respondents was variable. 12.5% of trainees not yet JAG certified in basic GI endoscopy had no access to a regular training list. 36% reported one regular weekly endoscopy training list and 49% were attending two lists per week.

A further question was asked about the composition of cases on the training list. 57% of respondents had a cap of 8 points on the list (where gastroscopy and flexible sigmoidoscopy are 1 point each and colonoscopy is 2 points), but a large proportion of respondents trained on lists where additional cases were added due to service pressures. Only 61% of respondents felt that their training list was appropriately adjusted to their training needs. Associated comments particularly highlighted the lack of access to adequate numbers of colonoscopies on training lists. Only 10% of trainees had any meaningful say in what type of cases were included on their training lists. Of those without a dedicated training list, some commented that they had access to a service list with ad hoc training.

Progression of basic training

The rate of progression through endoscopy training programmes is linked to organisation of training and access to lists. 70% of trainees reported having an allocated named endoscopy trainer and this was comparable for DGHs and tertiary centres. 68% of respondents indicated that they had achieved Certification in Upper GI Endoscopy by the end of their ST4 placement. 7% of ST7 trainees (3/43) reported they had not achieved JAG Certification for Upper GI endoscopy.

In colonoscopy training, the majority of trainees had performed less than 50 colonoscopies by the end of their ST4 placement. Only 27% of ST6 (14/52) and 65% (28/43) of ST7 trainees had performed more than 300 colonoscopies, with 23% of this combined group (22/95) having achieved full JAG accreditation in colonoscopy. 53% of ST7 trainees had not achieved full certification in colonoscopy.

Supervision, assessment and recording of training

When asked whether the trainer was present in the room during 'training lists' 85% of ST3/ST4 trainees reported acceptable supervision. 84% of trainees have a magnetic imager to assist with colonoscopy training lists. 83% of trainees record all of their procedures on the JAG Endoscopy Training System (JETS) portfolio (including many trainees who have already achieved certification). All trainees had completed at least one DOPS form per quarter, but 13% of trainees were recording DOPS at a low frequency (insufficient to support JAG certification). A quarter of trainees reported some difficulty in getting trainers to sign off DOPS assessments. When seeking to complete the Summative DOPS assessment required for JAG Certification 16% of trainees reported difficulties, which were more common in smaller hospitals. In general trainees found the

JETS e-portfolio easy to use, but commented that procedural data entry could be improved. Trainees' opinions on the use of the Personal Development Plan area varied from very useful to not at all useful.

Therapeutic and sub-specialty training

85% of trainees reported that they worked in a hospital with an out-of-hours acute GI bleeding rota, and this varies by deanery. Due to the nature of staffing of these rotas a third of trainees reported they had no direct participation in these cases. Of note, of the ST7 respondents 33% (14/43) reported that they have applied acute GI bleeding therapies in less than 30 cases and 9% (5/43) did not feel confident enough to manage acute GI bleeds independently.

Some trainees (9.6%) were receiving training in the resection of more complex polyps (larger than 2cm or difficult to access), and 55% worked in a unit where advanced polypectomy was carried out. Out of the 53% who had access to Endoscopic Retrograde Cholangiopancreatography (ERCP) training in their current centre, 15% of respondents were training in ERCP. 4% were training in Endoscopic Ultrasound (EUS), 2.6% in double balloon enteroscopy (DBE) and 7% in wireless capsule enteroscopy (WCE).

Barriers to training

74% of junior trainees (ST3/ST4) tend to be placed by Training Programme Directors in DGH hospitals, where for one-third of the week Gastroenterology specialty trainees will be committed to General Internal Medicine (GIM)-related activities. Of the senior trainees, 58% were in a tertiary centre, where on average only 10% of time was committed to GIM. Overall, 60% of trainees miss more than one fifth of their potential endoscopy training lists due to on-call rotas or GIM requirements. Two-thirds of respondents said they were able to make up some of the 'lost' lists by backfilling fellow trainees' lists, and 27% reported using annual leave or 'zero hours' days to attend endoscopy training lists.

Discussion

The 2016 BSG Trainees' Survey describes important issues facing the delivery of endoscopy training in the UK. Though the response rate of the national survey is low (34.3%), a factor which needs to be addressed in future surveys, the main findings accord well with other recent surveys and publications (28-33, 35). The main difficulties are identified as achieving access to sufficient numbers of cases to achieve timely certification in colonoscopy and to training in therapeutic endoscopy – particularly the management of acute GI bleeding. In the 2012 survey it was found that 50% of trainees were not achieving the minimum recommended number of colonoscopy procedures for their stage of training (27) therefore there seems to have been little improvement over the intervening 4-year period.

One of the main achievements of the UK JAG training system is the delivery of a

competency-based training programme to all trainees, which compares well against international reports (36-38). Survey respondents also highly valued the JAG e-portfolio (83% recorded all procedures), DOPS forms and courses which support training programmes. It is clear from this study that further evolution of training pathways is required. A recent European survey (39) incorporating 16 countries showed that only 70–89% of trainees performed the total number of endoscopic procedures to fulfil the requirements of the European Board. The European Board requires 200 diagnostic OGDs (same number as JAG) and 200 diagnostic colonoscopies (JAG standards require 300). This highlights the advantage of a standard in the UK which has to be achieved before working in a JAG-approved endoscopy unit. In Europe 52% of trainees have access to ERCP training which is equivalent to the 53% who have access in our survey. The European survey showed improvement from an older survey in 2002 (4) where one-third of final year trainees felt uncertain about endoscopic procedures and the number of procedures completed varied considerably. Internationally a structured training programme for polypectomy is lacking (40).

Only 61% of respondents had a training list which was adjusted to their training needs. In the UK the responsibility for governance of training is shared. Certification standards are set by the JAG, whilst the Specialist Advisory Committees (SACs) in Gastroenterology and Surgery provide the final approval of competence with the award of the Certificate of Completion of Training (CCT). The monitoring of training progress is devolved to the Postgraduate Deaneries via Training Programme Directors, who evaluate the progress in endoscopy training as part of a wider annual review of progress. The role of Local Training Leads has recently been given increasing prominence as they have responsibility for the organisation of induction, local assessment, appraisal and training lists (Figure 2).

Collaboration between these key stakeholders has resulted in measures to improve endoscopy training in the UK (Table 1). These measures have been drawn up taking into account JAG review data, individual deanery data from TPDs, and previous trainee surveys (27, 29-33). Any strategic approach must take account of the number of trainees requiring certification in a given endoscopic modality and a realistic assessment of the demands of the associated learning curve. For basic training in upper GI endoscopy and colonoscopy (including basic skills in polypectomy) the need is to develop competent, safe endoscopists in an efficient, cost effective manner. The training survey highlights the difficulties trainees are experiencing in accessing sufficient training opportunities. This concept of streamlining 'training pathways' has been evaluated in the SPRINT (Structured Programme of Induction and Training) programme in Wales and the Health Education England pilot for non-medical endoscopists (41-43). With appropriate induction, access to a weekly training list, strategically timed skills courses, and use of simulation and e-learning tools to improve lesion recognition skills (Standardised Lesion Assessment Tests in Endoscopy (SLATE)), then certification in Upper GI endoscopy within 9 to 12 months is readily achievable (43). Alternative models use 'immersion training', where blocks of time are dedicated to endoscopy alone, to achieve competency within a relatively short timeframe (44). Survey respondents were invited to

comment on ways to improve training and many suggested that blocks of endoscopy training would be useful. The principle barrier to endoscopic training is the amount of time spent in GIM. The proposed Shape of Training scheme will mean an additional year spent before selection for specialty training. This overall reduction in training time will most likely necessitate a reduced commitment to GIM in the four years of specialty training. This should allow for periods of focused endoscopic ‘immersion training’ in the future.

Table 1

Area of interest	Specific issue	Measures taken for improvement
Training lists	Access to lists	Grade B requirement in the GRS for base hospitals to provide a minimum of 20 training lists per year to every trainee
	Case selection	Grade B requirement in the GRS for evidence of baseline training needs assessment and adjusting of lists to meet training needs
Progress of basic training	Accelerated upper GI training	Adoption by all Deaneries of training programme adaptations which facilitate completion of upper GI endoscopic training within 12 months ‘Immersion training’ currently being evaluated
	Review of colonoscopy certification	JAG currently reviewing the certification requirements for colonoscopy, including basic polypectomy using competency based approach
	Appraisal of endoscopy training	Grade B requirement in the GRS for Local Training Leads to perform regular appraisal and set goals for training
Supervision / Assessment / Recording of training	Trainee feedback on JETS	Trainees are encouraged to leave feedback on training lists on JETS – GRS requires Local Training Leads to review this data annually with Trainers
	DOPS forms	JAG have updated a suite of DOPS forms for diagnostic and therapeutic procedures New e-learning tools e.g. SLATE are being considered
	JETS e-portfolio	JETS database to have update of procedural information forms

Therapeutic and sub-specialty endoscopy training	Certification of therapeutic training	JAG and BSGE are developing certification standards and KPIs for GI bleeding and sub-specialty endoscopy (ERCP, EUS, DBE, WCE)
	Development of training pathways	Specific courses and training resources are being developed to support certification requirements
	Access to training opportunities	Increased regional co-operation between TPDs and regional training leads; review of national sub-specialty training pathways and fellowships

It is also important to remember that trainees may require access to training in a range of endoscopic techniques. Figure 3 illustrates how training pathways may overlap within a specialty training programme. It shows how efficient upper GI training can 'shift to the left' training in lower GI and therapeutic endoscopy, creating more time within programme for trainees to complete the requirements for Certification. Evaluation of JETS data has mapped the learning curve for diagnostic colonoscopy. 95% of trainees will achieve competency having undertaken 230 and 250 procedures (24). A further multi-centre study is underway mapping the learning curve for polypectomy. A JAG working group is evaluating whether implementing certification of colonoscopy after 250 cases (compared with the current requirement for 300 cases) with evidence of safe polypectomy practice for polyps up to two centimetres with good access might improve efficiency of lower GI training, reducing the length of the pathway whilst maintaining standards based on assessment of competence.

Whilst the number of cases should not be the only arbiter of developing procedural competence, the ability to practice skills on regular training lists is essential. There is good evidence that setting clear training goals, feedback and deliberate practice are essential to the training process (45), as opposed to didactic lecture-based teaching. Mapping the progress of trainees on the JETS e-portfolio indicates that successful outcomes of training map to the provision of regular training lists. The Global Rating Scale, updated in April 2016, mandates a minimum level of dedicated Training Lists per trainee and this is a requirement for JAG Accreditation of Endoscopy Services (46). If trainers provide an educational scaffold this is highly valued by trainees (47,48). The training system as a whole may benefit from early discussion and guidance from Local Training Leads and TPDs as to which endoscopic procedures trainees should be training in.

Training in GI haemostasis illustrates the issues that underlie reported difficulties in accessing Core Therapeutic endoscopic training. 9% of final year trainees did not feel confident in managing acute GI bleeds independently. Trainees need to be competent to support local 24/7 bleeding rotas and to improve treatment outcomes described in the NCEPOD report (49). Nationally,

the JAG is working with the specialist societies and expert practitioners to develop Certification standards for training in the management of upper GI bleeding. This pathway will be supported by a dedicated course, GI bleeding simulation (50), DOPS assessments for variceal and non-variceal bleeding and knowledge-based learning resources. Regionally, TPDs will need to monitor progress in Core Therapeutic training and liaise with Local Training Leads who timetable dedicated GI bleeding lists, maintain a register of trainees requiring access to particular endoscopic techniques and supervised involvement of trainees on out-of-hours bleeding rotas.

As the numbers training in Endoscopic sub-specialties is relatively small compared to Core Therapies, a supra-regional or national training pathway for training may be more efficient and cost-effective. The JAG and British Society of Gastroenterology Endoscopy committee are working on Training Certification Standards for sub-specialty training. It is unlikely that trainees will be able to complete this type of training within a Specialty Training Programme and so JAG certification in sub-specialty endoscopic modalities will not be a requirement for the Certificate of Completion of Training (CCT). Despite this, the experience of implementing structured training in colonoscopy and demonstration of improved outcomes in UK National Colonoscopy audits over time (51, 52), suggests that structured training pathways in endoscopic sub-specialties will be valuable. It is hoped that a JAG Standards for Certification document will also provide a basis for further discussion with SACs, the General Medical Council and other key stakeholders with regard to the future regulation of endoscopic sub-specialty training in the UK.

A shortcoming of the survey was the lack of surgical trainees input due to invitations being sent to BSG trainees alone. Published surveys of surgical trainees have yielded comparative results (37,38) and they are under similar pressures of general surgical on-call commitments and access to training lists.

In summary, endoscopy training in the UK continues to evolve. Whilst most trainees have a good experience of basic training, further innovation is required to increase quality and efficiency of training pathways. In addition 12.5% of trainees had no access to a regular training list – the individual reasons for this were not explored further here, but streamlined access to training nationally is another issue which JAG seek to improve. A concern is the lack of progress from preceding surveys over the past eight years. Modifications to training techniques (DOPyS, a new polypectomy training tool) and training standards (JAG re-evaluation of targets) have been made as a result of those surveys (Table 1). Nonetheless constant re-evaluation and change is required to maintain and improve standards. 2016 has shown new high intensity programmes and transparent assessment being implemented nationally. Therapeutic training and its organisation, both locally and regionally, are under the spotlight. An anticipated development is the publication by the JAG of training certification standards for all diagnostic and therapeutic training. Future surveys will be required to monitor the overall effects of training on the ground, especially in the context of increased service pressures and time constraints imposed by training programmes and on-call duties.

References

1. X Xiong, AN Barkun, K Waschke, et al; and the Canadian Gastroenterology Training Program Directors. Current status of core and advanced adult gastrointestinal endoscopy training in Canada: Survey of existing accredited programs. *Can J Gastroenterol* 2013;27(5):267-272.
2. Heller SJ, Tokar JL. Current status of advanced gastrointestinal endoscopy training fellowships in the United States. *Advances in Medical Education and Practice*. 2011;2:25-34. doi:10.2147/AMEP.S13310.
3. Papanikolaou IS, Karatzas PS, Varytimiadis LT, et al. Effective colonoscopy training techniques: strategies to improve patient outcomes. *Advances in Medical Education and Practice*. 2016;7:201-210. doi:10.2147/AMEP.S99617.
4. Bisschops R, Wilmer A, Tack J. A survey on gastroenterology training in Europe. *Gut*. 2002;50(5):724-729.
5. Telleman H, Burger TF, Mulder CJJ. Evolution of gastroenterology training. *World J Gastroenterol* 2009; 15(15): 1793-1798.
6. Stanford SB, Lee S, Masaquel C, et al. Achieving competence in colonoscopy: Milestones and the need for a new endoscopic curriculum in gastroenterology training. *World Journal of Gastrointestinal Endoscopy*. 2015;7(18):1279-1286.
7. Ekkelenkamp VE, Koch AD, de Man RA, et al. Training and competence assessment in GI endoscopy: a systematic review. *Gut* 2016 Apr;65(4):607-15. doi: 10.1136/gutjnl-2014-307173. Epub 2015 Jan 30.
8. Raman M, Donnon T. Procedural skills education – colonoscopy as a model. *Canadian Journal of Gastroenterology*. 2008;22(9):767-770.
9. Zupanc CM, Burgess-Limerick R, Hill A, et al. A competency framework for colonoscopy training derived from cognitive task analysis techniques and expert review. *BMC Medical Education*. 2015;15:216. doi:10.1186/s12909-015-0494-z.
10. Pape-Koehler C, Immenroth M, Sauerland S, et al. Multimedia-based training on Internet platforms improves surgical performance: a randomized controlled trial. *Surgical Endoscopy*. 2013;27(5):1737-1747. doi:10.1007/s00464-012-2672-y.
11. Yao K, Uedo N, Muto M, et al. Development of an E-learning System for the Endoscopic Diagnosis of Early Gastric Cancer: An International Multicenter Randomized Controlled Trial. *EBioMedicine*. 2016;9:140-147. doi:10.1016/j.ebiom.2016.05.016.
12. Mabe K, Yao K, Nojima M, et al. An educational intervention to improve the endoscopist's ability to correctly diagnose small gastric lesions using magnifying endoscopy with narrow-band imaging. *Annals of Gastroenterology : Quarterly Publication of the Hellenic Society of Gastroenterology*. 2014;27(2):149-155.
13. Harpham-Lockyer L, Laskaratos F-M, Berlingieri P, et al. Role of virtual reality simulation in endoscopy training. *World Journal of Gastrointestinal Endoscopy*. 2015;7(18):1287-1294. doi:10.4253/wjge.v7.i18.1287.
14. McIntosh KS, Gregor JC, Khanna NV. Computer-based virtual reality colonoscopy simulation improves patient-based colonoscopy performance. *Canadian Journal of Gastroenterology & Hepatology*. 2014;28(4):203-206.
15. Thomas-Gibson S, Bassett P, Suzuki N, et al. Intensive training over 5 days improves colonoscopy skills long-term. *Endoscopy*. 2007 Sep;39(9):818-24.

16. De Win G, Van Bruwaene S, Kulkarni J, et al. An evidence-based laparoscopic simulation curriculum shortens the clinical learning curve and reduces surgical adverse events. *Advances in Medical Education and Practice*. 2016;7:357-370. doi:10.2147/AMEP.S102000.
17. Hashimoto DA, Sirimanna P, Gomez ED, et al. Deliberate Practice Enhances Quality of Laparoscopic Surgical Performance in a Randomized Controlled Trial: from Arrested Development to Expert Performance. *Surgical endoscopy*. 2015;29(11):3154-3162. doi:10.1007/s00464-014-4042-4.
18. Bosse HM, Mohr J, Buss B, et al. The benefit of repetitive skills training and frequency of expert feedback in the early acquisition of procedural skills. *BMC Medical Education*. 2015;15:22. doi:10.1186/s12909-015-0286-5.
19. Ahlborg L, Weurlander M, Hedman L, et al. Individualized feedback during simulated laparoscopic training: a mixed methods study. *International Journal of Medical Education*. 2015;6:93-100. doi:10.5116/ijme.55a2.218b.
20. Barton JR, Corbett S, van der Vleuten CP. The validity and reliability of a Direct Observation of Procedural Skills assessment tool: assessing colonoscopic skills of senior endoscopists. *Gastrointest Endosc*. 2012;75(3):591-7.
21. Gupta S, Anderson J, Bhandari P, et al. Development and validation of a novel method for assessing competency in polypectomy: direct observation of polypectomy skills. *Gastrointest Endosc*. 2011;73(6):1232-9.
22. James PD, Antonova L, Martel M, et al. Measures of trainee performance in advanced endoscopy: A systematic review. *Best Pract Res Clin Gastroenterol*. 2016 Jun;30(3):421-52. doi: 10.1016/j.bpg.2016.05.003. Epub 2016 May 27.
23. Walsh CM. In-training gastrointestinal endoscopy competency assessment tools: Types of tools, validation and impact. *Best Pract Res Clin Gastroenterol*. 2016 Jun;30(3):357-74. doi: 10.1016/j.bpg.2016.04.001. Epub 2016 Apr 16.
24. Ward ST, Mohammed MA, Walt R, et al. An analysis of the learning curve to achieve competency at colonoscopy using the JETS database. *Gut*. 2014;63:1746-54. [PMC free article] [PubMed]
25. Ward ST, Hancox A, Ismail T, et al. The learning curve to achieve competency in upper gastrointestinal endoscopy: analysis of completion rates using the jets database. *Gut* 2015;64:A405 doi:10.1136/gutjnl-2015-309861.889
26. Greenaway D. Shape of Training (General Medical Council) 2013. http://www.shapeoftraining.co.uk/static/documents/content/Shape_of_training_FINAL_Report.pdf_53977887.pdf
27. Neale JR, Basford PJ. General medical training in gastroenterology: views from specialist trainees on the challenges of dual accreditation. *Clinical Medicine* 2015;15:35-39.
28. Jones RP, Stylianides NA, Robertson AG, et al. National survey on endoscopy training in the UK. *Annals of the Royal College of Surgeons of England* 2015;97:386-389.
29. Haycock AV, Flanagan P, Ignjatovic A, et al. Gastroenterology training in 2008: results from the TIG/BSG national training survey. *Gut* 2009;58:A11-12.
30. Haycock AV, Ignjatovic A, Lamb C et al. Gastroenterology training in 2010: results from the TIG/BSG national training survey. *Gut* 2011;60:A120-121. Doi:10.1136/gut.2011.239301.255
31. Basford PJ, Samji S et al. UK training in therapeutic endoscopy – are we achieving the basics? Results of the BSG national training survey. *Gut* 2015;64:A409 doi:10.1136/gutjnl-2015-309861.898.

32. Biswas S, Alrubaiy L et al. Balancing gastroenterology and general internal medicine training in the UK. *Gut* 2015;64:A404-A405 doi:10.1136/gutjnl-2015-309861.888
33. Chadwick G, Budhilal S. PTU-050 Is current UK colonoscopy training fit for purpose? – results of the 2014 BSG training survey. *Gut* 2015;64:A81 doi:10.1136/gutjnl-2015-309861.165.
34. Lockett M, Romaya C. Gastroenterology workforce report – update June 2015. http://www.bsg.org.uk/pdf_word_docs/manpower_14.doc&rct=j&frm=1&q=&e src=s&sa=U&ved=0ahUKEwjDtMubhavQAhUJDMAKHfSrAxEQFggfMAI&usg=AF QjCNEc13ZWE2QcQI31SiUmXt_VjeQ2qQ
35. Penny HA, Kurien M, Wong E, et al. Changing trends in the UK management of upper GI bleeding; is there evidence of reduced UK training experience? *Frontline Gastroenterology* 2016;7:67-72.
36. Patel SG, Keswani R, Elta G, et al. Status of Competency-Based Medical Education in Endoscopy Training: A Nationwide Survey of US ACGME-Accredited Gastroenterology Training Programs. *American Journal of Gastroenterology* 2012;107:971-975 doi:10.1038/ajg.2011.481
37. Pace D, Borgaonkar M. Endoscopy training in Canada in general surgery residency programs: ways forward. *Canadian Journal of Surgery* 2015;58(6):E5-E6. doi:10.1503/cjs.009215.
38. Skubleny D, Switzer N, Karmali S, et al. Endoscopy services and training: a national survey of general surgeons. *Canadian Journal of Surgery* 2015;58(5):330-334.
39. Ianiro G, Maida M, Alrubaiy L et al. Differences and similarities of Gastroenterology training across Europe: A webbased, international survey. *UEGW poster* P0951. 2016.
40. Patel K, et al on behalf of BSG Trainees Section, Jover R, Koutroubakis I, et al. Experience in polypectomy training and assessment: an international survey. *Gut poster* OC-105. 2015.
41. Axe K, Hawkes E, Turner J, et al. A qualitative assessment of cognitive framework development in novice endoscopists: implications for programmed lesion recognition training. *Gut* 2015;64:A400 doi:10.1136/gutjnl-2015-309861.879
42. Axe K, Hawkes E, Turner J, et al. Learning curve for upper GI endoscopy – qualitative assessment of developmental phases of novice trainees. *Gut* 2015;64:Suppl 1 A399-A400 doi:10.1136/gutjnl-2015-309861.878
43. Hawkes N, Turner J, Hurley J. Accelerated training in upper GI endoscopy – an analysis of SPRINT programme outcomes. Presented at 2015 *UEG* meeting, Barcelona. ABS-2280.
44. Soma T, Sakamoto Y, Matsuoka Y, et al. Short-term training of upper gastrointestinal endoscopy for resident doctors in Sotogahama Central Hospital in Aomori, Japan. *Advances in Medical Education and Practice*. 2013;4:127-131. doi:10.2147/AMEP.S43476.
45. van Doorn SC, Bastiaansen BAJ, Thomas-Gibson S, et al. Polypectomy skills of gastroenterology fellows: can we improve them? *Endosc Int Open*. 2016 Feb; 4(2): E182–E189. doi: 10.1055/s-0041-109086
46. Joint Advisory Group on GI Endoscopy. Global rating scale (updated April 2016). <https://www.jagaccreditation.org/>

47. Wells C. The characteristics of an excellent endoscopy trainer. *Frontline Gastroenterol* 2010;1:13-18 doi:10.1136/fg.2009.000372
48. Thuraisingam AI, MacDonald J, Shaw IS. Insights into endoscopy training: a qualitative study of learning experience. *Med Teach*. 2006;28:453–459.
49. National Confidential Enquiry into Patient Outcome and Death (NCEPOD). Gastrointestinal Haemorrhage: Time to Get Control? (2015) <http://www.ncepod.org.uk/2015report1/downloads/TimeToGetControlFullReport.pdf>
50. Hochberger J, Matthes K, Maiss J, et al. Training with the compactEASIE biologic endoscopy simulator significantly improves hemostatic technical skill of gastroenterology fellows: a randomized controlled comparison with clinical endoscopy training alone. *Gastrointest Endosc*. 2005 Feb;61(2):204-15.
51. Bowles CJA, Leicester R, Romaya C, et al. A prospective study of colonoscopy practice in the UK today: are we adequately prepared for national colorectal cancer screening tomorrow? *Gut*. 2004;53(2):277-283. doi:10.1136/gut.2003.016436
52. Gavin DR, Valori RM, Anderson JT, et al. The national colonoscopy audit: a nationwide assessment of the quality and safety of colonoscopy in the UK. *Gut* 2013;62:242-249 doi:10.1136/gutjnl-2011-301848

FIGURES & TABLES

Box 1

KEY SURVEY FINDINGS
<ul style="list-style-type: none"> • 85% of trainees were satisfied with the level of supervision of their training • 12.5% of trainees had no access to a regular training list • Only 60% of training lists are adequately adjusted to trainees' needs – a particular problem in colonoscopy training • Access to therapeutic training is patchy and a quarter of senior GI trainees do not feel confident dealing with GI bleeding emergencies • Progress in endoscopy training is affected by which hospital a trainee is placed in, level of general medical duties and commitment to on-call rotas

Figure 1 - Survey respondents' characteristics by training grade and deanery

Figure 2 – Relationship and roles of national, regional and local training organisation that contributes to the delivery of an effective training pathway

Table 1 – Specific measures to address training issues highlighted in the BSG Trainees’ Survey

Figure 3 - A pathway perspective of endoscopy training: timing of individual training pathways for Specialist GI Trainees

Funding:

The BSG Trainees’ Section met costs associated with the survey. No external funding was received.

Authorship statement:

SB designed the survey with the help of LA, LC and NH and analysed results. SB and NH co-wrote the article. LA, LC, ML and AE reviewed and edited the article. The BSG Trainees’ Section committee commissioned and disseminated the survey.