OPINION

The future of gastroenterology training: instruction in technical skills

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Abstract

Endoscopy training has developed extensively over the past decade but despite significant improvements many challenges remain and further development of endoscopy training programmes and content is required. Endoscopy training is struggling with increasing pressure from service provision and competition for limited National Health Service (NHS) resources. There is a rapidly increasing proportion of work shifting from diagnostic to therapeutic practice in the face of limited dedicated therapeutic training provision. In addition, there is a need to align quality assurance outcomes related to endoscopic practice with the key NHS quality indicators of patient experience, clinical effectiveness and safety. A vision for the future of endoscopy training is presented focusing on the need to target training resources most effectively and developing technical skills training in parallel to non-technical skills training (eg, effective decision making, communication and teamwork). Proposals for specialist technical skills training, future information technology systems and quality assurance framework integration are developed. The need to challenge some existing culture and behaviours is explained along with a challenge to embed a life-long learning approach in endoscopy training. Endoscopy training developments aim to ensure a high quality assured endoscopy service for all patients, where a skilled workforce can be provided to meet rising demand and changing technical skills requirements.

Introduction

Endoscopy training has developed extensively over the past decade and yet, despite significant improvements, challenges remain. This paper aims to increase awareness of current endoscopy training issues and highlights some of the options for matching future endoscopy service demand with high quality service provision.

The paper gives a broad overview of current endoscopy training in the UK,

identifying some of the challenges which need to be addressed. Current thinking in relation to the development of endoscopy training in the near future is discussed and a more long term perspective is offered.

The emphasis at all times is on developing training in the context of an effective and efficient service, monitored by a robust outcome driven, quality assurance (QA) framework.

Current UK endoscopy training

The Joint Advisory Group (JAG) sets the quality standards for endoscopic training certification and independent practice in the UK (figure 1). Validated formative and summative assessment tools with descriptors provide a framework to ensure consistency.¹ The majority of all endoscopy training is delivered locally by staff within the employing hospital or endoscopy department. Further training options for independent endoscopists also exist (figure 2). A previous publication demonstrating poor performance of UK colonoscopists may, in part, have been a reflection of the teaching style and technique historically employed.² There remains considerable variation in the endoscopic performance and training a more recent national audit is in press and demonstrates significant progress and improvement.³

Four key factors have influenced endoscopy training development in the past decade in the UK.

1. JAG accreditation of endoscopy training units.
2. Introduction of an information technology (IT) platform to support training and JAG certification of endoscopists.
3. Development of a network of regional training centres.
4. Introduction of the national bowel cancer screening programme.

Figure 1 Overview of current endoscopy training provision in the UK. IT, information technology.

Current challenges for endoscopy training

Resources

Endoscopists are trained from a diverse range of specialty backgrounds. For some, endoscopy training and practice may represent an optional and attractive addition to existing activity. This can result in training provision being provided to individuals without a career pathway in endoscopy service provision. The timing of training is also important and must correlate with the opportunity to continue to perform endoscopy on a continuous basis. Without this, individuals may become deskilled and require additional training. Neither of these approaches delivers time or cost effective use of resource and it is neither desirable nor sustainable in the long term.

Organisational Culture and the Learning Environment

Organisational culture, values, structure and operational strategy can either support or inhibit the quality of training. These factors also influence and impact on the ability of staff to access training outside of the organisation.

In some endoscopy departments a cultural legacy persists which erroneously equates high throughput and quick procedure time with quality. This culture is perhaps exacerbated by National Health Service waiting time targets, continually increasing demand for endoscopy services and limited resources. Service demand pressures can lead to cancellation or overbooking of training lists, resulting in reduced training time. Training cannot flourish or develop in an environment under extreme service pressure. Time must be afforded to both trainers to train and to dedicated lists to train on.

While much progress has been made along the continuum towards achieving the JAG standards for training and the training environment, adverse organisational and departmental cultures persist in some areas. In addition, in respect of the actual skills

training, differing levels of commitment, engagement, experience and skill can be seen between individuals and departments.

Training needs to be accepted, supported, encouraged and staffed by committed and competent trainers. If quality is to be achieved and maintained, a life-long learning approach to endoscopy skills training and improvement is required from organisational, trainer and trainee perspectives.

Trainer Skills and Training

Historically, much of the endoscopy training consisted of observation, limited supervision and long periods of unsupervised experiential learning. Effective skills training requires specific individualised training, supported by performance enhancing instruction and feedback. This cannot be achieved by observation or simple supervision, but requires attentive and observant trainers with appropriate training in how to train in endoscopy.

Rapid progression to independent practice is frequently the primary trainee goal. This drive for independent practice is influenced by a variety of factors, including internal motivation, external service pressures and shortened specialist training programmes. This has led to a large cohort of self-taught endoscopists who become independent in endoscopic practice without sufficient experience or procedure numbers.

Without adequate experiential learning within a training structure, individuals are unable to fully develop the experience and skills necessary to deal with problems that may be encountered when practicing independently. Despite this, once independent, there has often been the expectation that individuals would help in the training of others. It should be recognised that a competent endoscopist with excellent performance data does not necessarily equate to a good or even competent trainer.

A key concept in skills training is that of conscious competence: the ability of the trainer to deconstruct the

Figure 2 Pathways and training available for independent endoscopists.

complex technical challenge and precisely articulate in small steps what is required for the trainee to succeed in a given task. This is crucial for effective endoscopy skills training. A frequent solution for endoscopy trainers without conscious competence is simply to ‘take over the scope’ and resolve any problems, rather than instruct and develop the trainee’s skills enabling them to overcome the challenge faced. A lack of conscious competence of the trainer in either the skill or the ability to teach does not necessarily lead to a failure of the procedure, but is suboptimal for training and can adversely affect the patient experience.

Finally, there is a cultural problem where independent colonoscopists will rarely, if ever, consider the need for ongoing skills training in endoscopic practice. Basic technique continues to develop alongside the newer developments in therapeutics and enhanced mucosal recognition. Without regular updates and training, deficiencies are likely to be highlighted with increasing monitoring and QA of practice.

Development of Therapeutic Training

There is increasing demand for endoscopy services generally and a concomitant increase for endotherapy and more specialised endoscopy techniques. This trend is expected to continue as a result of rapid access to diagnostic tests, symptom awareness campaigns and the introduction of population based cancer screening programmes.

Until recently, endoscopy training focused on acquisition of scope handling skills and successful completion of a procedure. Basic training did not explicitly include training in mucosal assessment, diagnosis and subsequent management, with very limited provision of dedicated therapeutics training. Therapeutic skills have mainly been developed from experiential self-learning.

Therapeutic assessment tools are being developed (eg, Direct Observation of Polypectomy Skill (DOPyS), a Direct Observation of Procedural Skill (DOPS) for

assessing polypectomy technique), but remain incomplete for all procedures and are still to be evaluated in formal assessment. Currently there is variation in technique, competence and patient outcome associated with therapeutic endoscopy.

Endoscopic Non-Technical Skills Training

Increasingly, expert endoscopists regard endoscopic non-technical skills training (ENTS) as the most significant component of their practice. Effective team work, communication and decision making skills will all contribute positively to individual performance and effectiveness and ENTS training focuses on these aspects, further driving the quality of training and ultimately the quality of service delivery.

Currently there is limited recognition, training or assessment of ENTS within endoscopy training although therapeutic training in particular is now evolving to include ENTS alongside any associated skills and knowledge training.

IT and QA Systems

The current IT systems used in endoscopy have primarily focused on the user interface. This has resulted in good endoscopy report generation but poor or limited output data. Endoscopy IT has also struggled to integrate with existing IT systems and automatic generation of good quality performance data is rare. This poses significant challenges when attempting to generate comparative data for analysis and review of departmental or individual performance. More importantly, the focus is mainly on inputs and outputs rather than outcomes which directly affect the patients.

It is generally considered that the patient associated risks for endoscopy increase in relation to therapeutics and more complex techniques. At present, endoscopy QA frameworks are yet to be agreed for all therapeutic procedures. Existing QA frameworks are not yet

fully outcome driven and remain limited by IT and data collection.

IT enables access to e-learning materials. e-Learning can potentially provide valuable core and background material supporting endoscopic skills development. High quality e-learning has the potential assist both trainers and trainees. Trainers will benefit from more training time dedicated to skills development. For the trainees and independent endoscopists there is the opportunity to increase lesion recognition skills and associated background information and management pathways. The structure and quality of the e-learning is more difficult to control and can benefit from identification and targeting of high quality web-based resources at appropriate stages in training.

Endoscopy Training: The Future

Endoscopy training in the UK needs to address the challenges outlined and many more. It must plan to provide appropriate numbers of skilled endoscopic practitioners to meet rapidly changing service demands and deliver a high quality and cost effective endoscopic service for all patients.

Endoscopy training needs to be supported, evidence based, effective, efficiently delivered, patient centred and focused on all endoscopist groups committed to providing the endoscopy service. Trainers need to promote a culture of excellence, teamwork and cost-efficient practice.

Resources

In the current financial climate, the cost and value of endoscopy training are likely to be scrutinised by organisations. Endoscopy training will need to be restricted by competitive entry and only be available to those individuals who will provide significant service provision. The training composition will be more targeted on individual requirements, which will be aligned to organisational service requirements and workforce planning.

There will be increasing use of IT and web-based learning programmes to support training requirements. Organisations and individuals will encourage the promotion of high quality and structured e-learning resources, which will reduce some of the training burden on trainers.

Organisational Culture and the Learning Environment

Individuals must recognise the need for, and commit to, life-long endoscopy training and skills improvement. As the expectations of patient and service commissioners rise, the ability to deliver high quality endoscopy services must be underpinned by a cultural change and acceptance that endoscopy training is a core component of the service provision that will continually evolve over time.

For trainees, the pathway for training will be well defined and supported by a training framework and supportive resources. Independent endoscopists will

need to accept and embrace the requirement and benefit from life-long training. Individual training requirements will be determined from performance data and QA processes, but should be pre-empted by internal motivation within a supportive culture.

Specialist Endoscopists

The QA associated with endoscopy practice has led to individuals becoming more focused on their individual needs and professional development. Dedicated specialist endoscopy posts are now emerging and will increase in popularity and number. With more dedicated endoscopists there is a reasonable expectation that the quality of procedures and performance of endoscopists will also improve, continuing to elevate the minimum standards of practice expected and accepted.

Training will need to match increasing quality expectations. ENTS such as communications, decision-making skills and teamwork will become a core component of endoscopy training and will form an increasing element of the summative assessment for certification and future revalidation of independent endoscopists. The number of general endoscopists will reduce and be replaced by dedicated specialists, providing more focused and specialised endoscopy practice, working within an integrated network of service provision. Individuals involved in endoscopic service provision will be expected, if not exclusively, to have a significant component of the job dedicated to service or training in endoscopy and related practice.

There will continue to be unified standards for certification and independent practice for all endoscopists. As standards are refined, they will improve and potentially appear more challenging to meet. Training of a future workforce requires adaptation and development of existing training pathways and structures. Significant commitment will be required by any trainees striving to achieve independent practice. It is currently unrealistic to expect the majority of trainees within existing training programmes, who achieve competence basic therapeutic modalities, to have acquired sufficient experience to also be competent in more advanced technical skills.

A period of dedicated immersion training in endoscopy offers one option to overcome limited endoscopic training opportunities in conventional training programmes. A period of additional mentored training beyond the existing training programme may serve as an alternative strategy. Long term solutions may favour the development of specialist endoscopists and related training programmes. This is particularly relevant to advanced endotherapy and specialist endoscopic techniques. This model has worked well in other countries such as Japan, where an apprenticeship model is offered, with trainees benefiting from a structured and closely supervised specialist training programme. It may well be that more advanced therapy and specialist techniques are acquired primarily by those established

in independent practice. A model for this exists in surgery through the Lapco programme.

As specialist endoscopist posts become more widespread and accepted, training may adapt to offer Certificate of Completion of Specialist Training (CCST) equivalents solely for endoscopy and a related practice. This will provide a platform for individuals to target training and lead to a natural progression to more complex and specialist practice.

Regional Training Centres and Networks

Regional training centres will continue to provide training courses and interventions suitable for the majority of endoscopists. They will focus on providing a specialist training resource responsive to regional needs. Mandated courses will be replaced by a more bespoke training programmes delivered by competent, effective local trainers. Supplementary specific skills improvement programmes/courses will be available as required through the regional training centres. More general training events will ensure everyone is afforded an opportunity to become familiar with new methods, techniques, standards and guidelines for practice.

There will be a development of regional referral networks for highly specialised and advanced endotherapy. Some training centres will evolve and new centres emerge as 'regional specialist centres'. Multi-disciplinary team meetings will be integrated using developing IT and available for all types of cases, with outcome data shared and monitored. Networks will provide the experience, expertise and advice to support regional service planning and training for new developments and techniques. There will be a requirement to demonstrate that the volume of specialist work matches the requirements of both trainers (to maintain skills) and any trainees. The supporting training environment and equipment will include simulators and animal or synthetic models enabling progressive training while protecting patients. Ideally, models and simulators would be available in all training units. The cost of this is likely to be prohibitive. It is likely that individuals who require high volume experiential learning (frequently required at the initial stages of skills acquisition) will be required to spend time on models and simulators before exposure to patients. This will be necessary for basic skills acquisition^{4,5} as well as more advanced techniques.

Trainer Skills and Training

All trainers will be required to demonstrate individual performance data that exceed the quality standards set for the procedure for which they provide training. In addition, trainers will be required to have undertaken formal training in endoscopy teaching methodology. There will be a requirement for trainers to demonstrate conscious competence of both the technical skill and training methodology, supported by feedback and training performance review via JAG Endoscopy Training System (JETS).

Table 1 Future categories of dedicated endoscopy trainers

Base trainers	Independent hospital endoscopists and the main trainer type, using regular training lists in their base units/hospitals. Providing trainees with the majority of their structured endoscopic training to help develop and refine their endoscopic skills.
Target trainers	Individuals with a specific interest in education and training initially identified from faculty in regional endoscopy training centres, where they will be involved in provision of regular training courses. Provide a higher level input into the training progression of individuals on a more ad hoc basis, dependent on the individual. Trainees will use regular lists with their base trainer to address highlighted learning objectives from target trainer sessions, further accelerating their skills development.
Service trainers	Providing high volume workload exposure to trainees under supervision rather than dedicated training, but including opportunistic training. Enabling trainees to accrue significant endoscopic experience. This training will precede application for certification of full independent practice.
Specialist trainers	Specialist knowledge and expertise in either endoscopic therapeutics (eg, pEMR, ESD) or practice in a more specialised field of endoscopy (eg, EUS, ERCP, capsule). Trainees and independent practitioners will compete for selection on specialist training programmes with these trainers.

ESD, endoscopic surgical dissection; pEMR, piecemeal endoscopic mucosal resection.

Training the trainers courses can provide insights and a template supporting endoscopy training skills acquisition. Regular training with reflective practice and supporting mentorship is the key to successful progression and development of trainers. Trainee feedback will provide the most important measure of success.

Table 1 outlines the responsibilities for four future endoscopy trainer categories.

Development of therapeutic skills training

To match the increasing demand for therapeutic procedures, formal therapeutic training and robust data supporting independent competence will become a fundamental requirement for both JAG certification and ongoing independent practice. Advanced training will follow a template which will include observation and knowledge acquisition, assisting and model training, supervision and mentorship before being certified for independent advanced training practice.

Endoscopic Non-Technical Skills Training

Central to the long term vision for endoscopy training is the assertion that endoscopy skills training cannot be divorced from service provision and the culture within the units and organisations in which it operates. ENTs such as team working, decision making and communication must become integral to endoscopy training and develop in parallel any technical skills training provided.

IT and QA Systems Development

IT development in endoscopy will support QA frameworks and the collation of specific data which highlights

individuals or departments who may require training support. Ultimately endoscopy IT will provide the data to confirm improvements in quality and outcomes for patients. There will be a mandate for software developers to ensure data output can support the evolving QA demands in an integrated system.

JAG and JETS will continue to support trainees and trainers. Knowledge and associated learning that support skills training will be increasingly delivered through e-learning and will be tracked in the e-portfolio, available for review by trainers. This system will enable more effective targeting of trainer resource to skills development, leading to a content review of the mandated JAG courses. Future use of e-learning will be in a structured and integrated manner.

IT will enable case discussion and multi-disciplinary teams to link remote units ensuring optimal decision making, equal access and uniform quality of all service modalities for patients independent of local resource provision.

IT systems will ultimately provide seamless, automated monitoring of the performance of units, individuals and the outcomes of the service provided. IT will also provide the working platform to ensure appropriate use of resource, generate high quality records and offer the potential for rapid transfer of data and records to other individuals and organisations in an immediately useable format.

With an increasing focus on therapeutic endoscopy, the requirement for specific therapeutic skills training will become mandated prior to JAG certification, raising the quality standard. Monitoring of therapeutic performance data and outcomes will be a requirement for ongoing independent practice.

Endotherapy skills training and QA will focus on appropriate utilisation, therapeutic procedures and outcome data produced relating directly to patients and purchasers of the service. Quality standards for procedures will continue to evolve to focus on outcomes such as patient satisfaction, safety and clinical effectiveness.

Service commissioners are likely to drive quality by requiring robust performance data from service providers; in turn, service providers are also likely to require formal QA for individuals in the form of mandatory endoscopy skills updates and proof of ongoing learning and training. Endoscopy training development and provision must be responsive to the needs of service providers and commissioners alike.

Conclusion

Much progress has been made in endoscopy training with corresponding improvements in quality of service provision. A number of challenges lie ahead and a clear training strategy incorporating the factors identified is required to ensure that future QA and demand for endoscopy can be met by skilled practitioners and trainers supported by the appropriate IT, networks and training environment.

Competing interests None.

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