

Curricula for postgraduate training in advanced endoscopic procedures, rationale and methodology: European Society of Gastrointestinal Endoscopy (ESGE) position statement

Raf Bisschops

University Hospitals Leuven, Department of Gastroenterology and Hepatology, TARGID, KU Leuven, Belgium

Evelien Dekker

Department of Gastroenterology and Hepatology, Academic Medical Center, Amsterdam, The Netherlands

James East

Translational Gastroenterology Unit, Nuffield Department of Medicine, Experimental Medicine Division, John Radcliffe Hospital, University of Oxford, Oxford, UK

Oxford NIHR Biomedical Research Centre, Oxford, UK

Gavin Johnson

University College London Hospitals, London, UK

Pedro Pimentel Nunès

Gastroenterology Department, Portuguese Oncology Institute of Porto, Porto, Portugal

Center for research in health technologies and information systems (CINTESIS) Faculty of Medicine, University of Porto, Porto, Portugal

Surgery and Physiology Department, Faculty of Medicine of the University of Porto, Porto, Portugal

David Saunders

Gastroenterology and Liver Unit, Royal Hallamshire Hospital, Sheffield, UK

Mario Dinis-Ribeiro

Gastroenterology Department, Portuguese Oncology Institute of Porto, Porto, Portugal

Center for research in health technologies and information systems (CINTESIS) Faculty of Medicine, University of Porto, Porto, Portugal

Thierry Ponchon

Gastroenterology Division, Edouard Herriot Hospital, Lyon, France

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ABBREVIATION

WG : working group

ESD : Endoscopic submucosal dissection

EMR : endoscopic mucosal resection

The challenge of postgraduate training in endoscopy

Due to the accelerated development of new diagnostic and therapeutic techniques, graduated and certified endoscopists are confronted with new challenges in terms of achieving competence and providing up-to-date safe patient care in gastrointestinal endoscopy. Indeed, most standard curricula for endoscopic training during a gastroenterology or surgical fellowship do not cover new diagnostic or therapeutic techniques. On the other hand, some older techniques like ERCP are more difficult to learn due to a shift from a formerly diagnostic to now a solely therapeutic intervention with increasing levels of technical difficulty when combined with interventional EUS. Indeed, a generation of endoscopists that had the opportunity to obtain a lot of experience in improving the cannulation rate, one of the key performance measures for ERCP[1], is now slowly retiring and the next generation is confronted with more complex cases earlier in their career. Because of the shift to therapeutic ERCP and the inherent potential complications, this is not standardly included in the core curriculum of gastrointestinal fellows in many countries. In addition, there seems to be a continuously increasing demand for interventional therapeutic endoscopy that in itself has become more complex with the introduction of new and more invasive procedures (Peroral endoscopic myotomy, Endoscopic submucosal dissection (ESD), combined endoscopic ultrasound and ERCP for hepatobiliary interventions,). This in turn will increase the demand for more human resources in interventional endoscopy that need to be properly trained.

ESGE has in the past embraced quality in endoscopy as one of the main themes to put on the agenda in order to provide the highest quality of endoscopic care to our patients [2]. Evidently, the quality of the delivered patient care will be directly related to the technical and cognitive skills of the endoscopist. As a consequence the quality of endoscopy is correlated to the quality in training. In 2017 the ESGE board initiated the Curricula Working Group (WG), in order to develop a curriculum for minimal standards and training for specific endoscopic procedures that are more interventional or advanced and in general require additional training beyond a core curriculum provided in each country. The aim is not to address a generic and general endoscopic training curriculum for fellows in endoscopy training. This is mostly defined by and falls under the legal responsibility and authority of the national accreditation instances and may differ throughout the different European member states.

Major challenges need to be met in order to compose such a training curriculum. Acquiring skills for performing advanced therapeutic endoscopy requires technical training but also cognitive understanding of indications, complications, limitations and therapeutic alternatives. It is clear that numbers of procedures are insufficient to guarantee technical competence in an advanced procedure. Indeed, in a recent systematic review, it was shown that studies exploring threshold numbers to reach competence in colonoscopy and ERCP vary significantly. More promise lies in the development and evaluation of assessment tools, which have been developed for some basic endoscopic procedures like colonoscopy[3]. Assessment forms like for instance the British Direct

Observation of Procedural Skills (DOPS) or the Mayo Colonoscopy Skills Assessment Tool (MCSAT) are more effective in discriminating different experience levels and can be used in training settings [4,5].

In addition, a simulator based colonoscopy training on its own lacks the discriminative power to assess performance and competence levels in real life patient-based endoscopy. [3]. This implies that patient-based learning curves are in fact reality and necessity for training and that patients will be exposed to the potential harm of yet less experienced endoscopist. In order to overcome this, in general a stepwise introduction is proposed for interventional endoscopy. For instance, ASGE has proposed a 3 step grading scale for complexity in biliary and pancreatic ERCP procedures. When a certain threshold in the learning curve of the endoscopist is reached, more complex procedures can be introduced in the training program [6]. Despite the challenging nature of training in complex procedures and large variation in learning curves, a systematic approach with standardized assessment with for instance "The EUS and ERCP Skills Assessment Tool" (TEESAT) has been proven to work in order to conclude an advanced endoscopy trainee has cognitive and technical competence. Moreover, this translates in achieving the key performance measures during the first year of independent practise [7,8]. For some advanced endoscopic procedures training in animal models may have a significant additional ethical value : it allows the endoscopist to become acquainted with different devices and basic techniques without any hazard for a patient [9] and that this has a significant improvement for the technical aspects of ESD, for instance in the colon porcine pig [10]. In addition, prior to engaging in endoscopic resection of neoplastic lesions by ESD or EMR , an additional training in optical diagnosis to increase detection and characterisation skills is mandatory. Indeed, the endoscopists needs to manage the skills to identify macroscopic morphological features and combine this with advanced imaging to identify the features that may indicate deep submucosal invasion and excludes a curative endoscopic resection [11,12]. This can probably be achieved with a minimum of effort by standardized training programs. Indeed, it has been shown that if endoscopists participating in a colorectal cancer screening program are trained in optical diagnosis with a validated training module, they achieve a high negative predictive value for neoplastic lesions of > 90% and can achieve a surveillance interval that is in concordance with histology in 95% of the cases. Interestingly, there is no significant difference if there is regular interim feedback to the endoscopist or not [13,14]. These modules can be made available online like for instance the BORN module. This well developed and properly validated web based educational tool , clearly improves the endoscopists skills to detect and delineate Barrett's lesions [15].

METHODOLOGY

Obviously many advanced techniques need to be covered. As a first step we initiated in 2017 the curriculum working groups for ESD, Optical diagnosis and Small bowel endoscopy. In 2019 a working group on ERCP and interventional EUS was additionally instigated. We anticipate to activate additional working groups for diagnostic EUS, Endoluminal treatment of oesophageal neoplasia and Endoscopic mucosal resection of lateral spreading tumours in the colon.

ESGE strived to approach the development of postgraduate training curricula in the best possible scientific way. All groups were composed of candidates that were selected by the WG chair and curriculum chair after a call for participants from the ESGE. All groups are initiated with a face to face meeting to explain the methodology. In a first step all WGs defined different categories and tasks that need to be addressed in order to define specific endpoints and thresholds for proficiency and competence in the different steps (For instance optical diagnosis will not only cover colorectal polyps but also Barrett's neoplasia, gastric lesions etc.) and aspects of training (pre-training prerequisites, cognitive and technical skills of the trainee, requirements for the trainers). Subsequently, an extensive literature search was conducted through the Medline (via Pubmed) and Google to search

for available evidence to support assessment of technical and cognitive competence, (validated) training modules and assessment scales and minimal requirements of trainers or training centres. In a third step, the literature search was summarized and evidence was graded according to the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system [16]. In a next step statements were formulated based on the evidence and were further developed through internal discussions in the WGs through teleconferencing or face to face meetings. The statements formed the basis for the construction of the curriculum. Agreement on the statements was achieved through a modified Delphi process. For the latter, at least 10 additional experts were invited to vote on the statements. Statements were accepted if an agreement of 80% was agreed after at least 3 Delphi voting rounds. After each voting rounds, comments and remarks generated during the Delphi process were discussed to adjust the statements. This entire process was conducted online and was entirely traced. In a final step, the WGs were instructed to create a trainee road book for the specific postgraduate training, based on the consensus reached in the Delphi process. Each WG will write a positions statement manuscript that will be distributed for review to ESGE members.

CONCLUSION AND FUTURE PROSPECTS.

ESGE has a vision to create a thriving community of endoscopy services and endoscopists in Europe, to provide high quality of care that is patient-centred [17]. The ESGE curriculum initiative fits entirely within this framework. The curricula that will be produced in the next 2 years are the first step and effort to harmonize training in advanced endoscopy with the aim to set a standard for all endoscopists in Europe before engaging independently in these new interventional therapies and in order to provide safe treatments to patients. After finalization of the curricula, further collaboration with the ESGE educational committee and e-learning WG will be necessary to provide ESGE endorsed training modules. Ultimately, instigation of ESGE certification for certain aspects of advanced training could be the ultimate goal for our endoscopy society.

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References

- ¹ Domagk D, Oppong K, Aabakken L, Czako L, Gyökeres T, Manes G, Meier P, Poley J-W, Ponchon T, Tringali A, Bellisario C, Minozzi S, Senore C, Bennett C, Bretthauer M, Hassan C, Kaminski M, Dinis-Ribeiro M, Rees C, Spada C, Valori R, Bisschops R, Rutter M. Performance measures for ERCP and endoscopic ultrasound: a European Society of Gastrointestinal Endoscopy (ESGE) Quality Improvement Initiative. *Endoscopy* 2018; 50: 1116–1127 Im Internet: <http://www.ncbi.nlm.nih.gov/pubmed/30340220>
- ² Rutter MD, Senore C, Bisschops R, Domagk D, Valori R, Kaminski MF, Spada C, Bretthauer M, Bennett C, Bellisario C, Minozzi S, Hassan C, Rees C, Dinis-Ribeiro M, Hucl T, Ponchon T, Aabakken L, Fockens P. The European Society of Gastrointestinal Endoscopy Quality Improvement Initiative: developing performance measures. *Endoscopy* 2016; 48: 81–89 Im Internet: <http://www.thieme-connect.de/DOI/DOI?10.1055/s-0035-1569580>
- ³ Ekkelenkamp VE, Koch AD, de Man RA, Kuipers EJ. Training and competence assessment in GI

- endoscopy: a systematic review. Im Internet: <http://dx.doi.org/10.1136/gutjnl-2014-307173>
- 4 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: 591–597 Im Internet: <https://linkinghub.elsevier.com/retrieve/pii/S0016510711022875>
- 5 Sedlack RE. The Mayo Colonoscopy Skills Assessment Tool: validation of a unique instrument to assess colonoscopy skills in trainees. *Gastrointest Endosc* 2010; 72: 1125-1133.e3 Im Internet: <https://linkinghub.elsevier.com/retrieve/pii/S0016510710020833>
- 6 Jorgensen J, Kubiliun N, Law JK, Al-Haddad MA, Bingener-Casey J, Christie JA, Davila RE, Kwon RS, Obstein KL, Qureshi WA, Sedlack RE, Wagh MS, Zanchetti D, Coyle WJ. Communication from the ASGE Training Committee ERCP CORE CURRICULUM Endoscopic retrograde cholangiopancreatography (ERCP): core curriculum Prepared by: ASGE TRAINING COMMITTEE. 2016; Im Internet: <http://dx.doi.org/10.1016/j.gie.2015.11.006>
- 7 Wani S, Keswani RN, Petersen B, Edmundowicz SA, Walsh CM, Huang C, Cohen J, Cote G. Training in EUS and ERCP: standardizing methods to assess competence. 2018; Im Internet: <https://doi.org/10.1016/j.gie.2018.02.009>
- 8 Wani S, Hall M, Wang AY, DiMaio CJ, Raman Muthusamy V, Keswani RN, Brauer BC, Easler JJ, Yen RD, El Hajj I, Fukami N, Ghassemi KF, Gonzalez S, Hosford L, Hollander TG, Wilson R, Kushnir VM, Ahmad J, Murad F, Prabhu A, Watson RR, Strand DS, Amateau SK, Attwell A, Shah RJ, Early D, Edmundowicz SA, Mullady D. Variation in learning curves and competence for ERCP among advanced endoscopy trainees by using cumulative sum analysis. 2016; Im Internet: <http://dx.doi.org/10.1016/j.gie.2015.10.022>
- 9 Herreros De Tejada A. ESD training: A challenging path to excellence. *World J Gastrointest Endosc* 2014; 6 Im Internet: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3985151/pdf/WJGE-6-112.pdf>
- 10 Gromski MA, Cohen J, Saito Kayoko, Gonzalez J-M, Sawhney M, Changdon Kang , Moore A, Matthes K. Learning colorectal endoscopic submucosal dissection: a prospective learning curve study using a novel ex vivo simulator "Learning Colonic Endoscopic Submucosal Dissection (C-ESD): A Prospective Study Assessing Training Using an Ex Vivo Simulator. *Surg Endosc* 2017; 31: 4231–4237 Im Internet: [https://link.springer-com.kuleuven.ezproxy.kuleuven.be/content/pdf/10.1007%2Fs00464-017-5484-2.pdf](https://link.springer.com.kuleuven.ezproxy.kuleuven.be/content/pdf/10.1007%2Fs00464-017-5484-2.pdf)
- 11 Burgess NG, Hourigan LF, Zanati SA, Brown GJ, Singh R, Williams SJ, Raftopoulos SC, Ormonde D, Moss A, Byth K, Mahajan H, McLeod D, Bourke MJ. Risk Stratification for Covert Invasive Cancer Among Patients Referred for Colonic Endoscopic Mucosal Resection: A Large Multicenter Cohort. *Gastroenterology* 2017; 153: 732-742.e1 Im Internet: <http://www.ncbi.nlm.nih.gov/pubmed/28583826>
- 12 Puig I, López-Cerón M, Arnau A, Rosiñol Ò, Cuatrecasas M, Herreros-de-Tejada A, Ferrández Á, Serra-Burriel M, Nogales Ó, Vida F, de Castro L, López-Vicente J, Vega P, Álvarez-González MA, González-Santiago J, Hernández-Conde M, Díez-Redondo P, Rivero-Sánchez L, Gimeno-García AZ, Burgos A, García-Alonso FJ, Bustamante-Balén M, Martínez-Bauer E, Peñas B, Pellise M, EndoCAR group, Spanish Gastroenterological Association and the Spanish Digestive Endoscopy Society G, Peligros I, Baiges AT, Elbouayadl L, Carames N, Iglesias M, Carmen S del, González-Lois C, Núñez H, Hernández SG, Pasterián LG, Carreira ML, Casalots Á, Caminoa A, Solano M, López-Ibáñez M, Llaó J, Estévez P, Rodríguez-Alcalde D, Soto S, Pantaleón M, Álvarez A, Martínez TZ, Pascual JM, Ducóns J, García-Lledó J, Porta F, Hernández V, Cubiella J, Riu F, Simón MÁ, Martínez D, Seoane A, Gomollón F, Cid L, Sostres C, Domínguez F, Macenlle

- RM, Revilla J de la, Isava Á, Campo R, Poza G de la, Martínez A, Quintas P, Sánchez E, Foruny JR, Marín E, Martínez JL, Castro MI, González JÁ, Llop E, Martín E, Rey R, Sort P, Montesinos J, Fornells M, Ascon N. Accuracy of the Narrow-Band Imaging International Colorectal Endoscopic Classification System in Identification of Deep Invasion in Colorectal Polyps. *Gastroenterology* 2019; 156: 75–87 Im Internet: <http://www.ncbi.nlm.nih.gov/pubmed/30296432>
- ¹³ McGill S, Soetikno R, Rastogi A, Rouse R, Sato T, Bansal A, McQuaid K, Kaltenbach T. Endoscopists can sustain high performance for the optical diagnosis of colorectal polyps following standardized and continued training. *Endoscopy* 2014; 47: 200–206 Im Internet: <http://www.ncbi.nlm.nih.gov/pubmed/25264764>
- ¹⁴ Vleugels JLA, Dijkgraaf MGW, Hazewinkel Y, Wanders LK, Fockens P, Dekker E. Effects of Training and Feedback on Accuracy of Predicting Rectosigmoid Neoplastic Lesions and Selection of Surveillance Intervals by Endoscopists Performing Optical Diagnosis of Diminutive Polyps. 2018; Im Internet: <https://doi.org/10.1053/j.gastro.2018.01.063>
- ¹⁵ Bergman JJGHM, de Groof AJ, Pech O, Ragunath K, Armstrong D, Mostafavi N, Lundell L, Dent J, Vieth M, Tytgat GN, Sharma P, International Working Group for Classification of Oesophagitis. An Interactive Web-Based Educational Tool Improves Detection and Delineation of Barrett's Esophagus-Related Neoplasia. *Gastroenterology* 2019; 156: 1299-1308.e3 Im Internet: <https://linkinghub.elsevier.com/retrieve/pii/S0016508518354362>
- ¹⁶ Atkins D, Best D, Briss PA, Eccles M, Falck-Ytter Y, Flottorp S, Guyatt GH, Harbour RT, Haugh MC, Henry D, Hill S, Jaeschke R, Leng G, Liberati A, Magrini N, Mason J, Middleton P, Mrukowicz J, O'Connell D, Oxman AD, Phillips B, Schünemann HJ, Edejer TT-T, Varonen H, Vist GE, Williams JW, Zaza S, GRADE Working Group. Grading quality of evidence and strength of recommendations. *BMJ* 2004; 328: 1490 Im Internet: <http://www.ncbi.nlm.nih.gov/pubmed/15205295>
- ¹⁷ Rutter MD, Senore C, Bisschops R, Domagk D, Valori R, Kaminski MF, Spada C, Bretthauer M, Bennett C, Bellisario C, Minozzi S, Hassan C, Rees C, Dinis-Ribeiro M, Hucl T, Ponchon T, Aabakken L, Fockens P. The European Society of Gastrointestinal Endoscopy Quality Improvement Initiative: developing performance measures. *United Eur Gastroenterol J* 2016; 4: 30–41 Im Internet: <http://ueg.sagepub.com/lookup/doi/10.1177/2050640615624631>