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JAG consensus statements for training and certification in oesophagogastroduodenoscopy

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ABSTRACT

Introduction Training and quality assurance in oesophagogastroduodenoscopy (OGD) is important to ensure competent practice. A national evidence-based review was undertaken to update and develop standards and recommendations for OGD training and certification.

Methods Under the oversight of the Joint Advisory Group (JAG), a modified Delphi process was conducted with stakeholder representation from British Society of Gastroenterology, Association of Upper Gastrointestinal Surgeons, trainees and trainers. Recommendations on OGD training and certification were formulated following literature review and appraised using Grading of Recommendations Assessment, Development and Evaluation. These were subjected to electronic voting to achieve consensus. Accepted statements were incorporated into the updated certification pathway.

Results In total, 32 recommendation statements were generated for the following domains: definition of competence (4 statements), acquisition of competence (12 statements), assessment of competence (10 statements) and post-certification support (6 statements). The consensus process led to following certification criteria: (1) performing ≥250 hands-on procedures; (2) attending a JAG-accredited basic skills course; (3) attainment of relevant minimal performance standards defined by British Society of Gastroenterology/Association of Upper Gastrointestinal Surgeons of Great Britain and Ireland, (4) achieving physically unassisted D2 intubation and J-manoeuvre in ≥95% of recent procedures, (5) satisfactory performance in formative and summative direct observation of procedural skills assessments.

Conclusion The JAG standards for diagnostic OGD have been updated following evidence-based consensus. These standards are intended to support training, improve competency assessment to uphold standards of practice and provide support to the newly-independent practitioner.

INTRODUCTION

Oesophagogastroduodenoscopy (OGD) is the single most commonly performed endoscopic procedure in the UK, with over 1 million procedures per year.[1] Over the last decade, ongoing efforts to improve quality of OGD worldwide have been driven by the high rates of post-endoscopy upper gastrointestinal cancer (PEUGIC), improvements in colonoscopy outcomes and increasing expectations by patients to receive high quality endoscopy.[2] These have included the development of national quality standards which define the requirements for competent OGD practice.[3]

Pivotal to quality assurance in endoscopy is training and certification. In the UK, the Joint Advisory Group in Gastrointestinal Endoscopy (JAG) oversees endoscopy training and certification.[4] Certification is a standardised process which formally credentials a trainee for independent and unsupervised endoscopy nationwide.[5] The JAG OGD certification process was originally formulated in 2011 based on pragmatism, in an era where evidence and quality standards on OGD training were lacking. With the development of national quality standards, and the increasing body of evidence relevant to OGD training, there was a call to review the existing certification pathways in endoscopy.

Following consultation with UK Specialist Advisory Committees, a committee was assembled by JAG and its stakeholders, including the British Society of Gastroenterology (BSG) and the Association of Upper Gastrointestinal Surgeons of Great Britain and Ireland (AUGIS), to develop evidence and consensus-based recommendations relevant to training and certification in diagnostic OGD. The aim was to develop a robust set of recommendations which would form the framework of OGD certification within the UK. Specifically, recommendations were made on the following areas: (1) definition of competence, (2) acquisition of competence, (3) assessment of competence and (4) post-certification support.

The following aspects were considered beyond the scope of this guideline:

- Paediatric OGD.
- Therapeutics, for example, upper gastrointestinal (GI) bleeding.
- Optical diagnosis.
- Barrett's oesophagus.

METHODS

Guideline development

A modified DELPHI process was commissioned by the JAG Quality Assurance of Training Working Group, with inclusion of JAG, BSG, AUGIS, training leads and trainee members, nursing and medical representatives and including representation from England, Wales, Scotland and Northern Ireland. Through a series of teleconferences, participants were allocated to four working groups based on the scope of the guideline. Each working group was tasked with framing questions relevant to training and certification, using a Population, Intervention, Comparator, Outcome format where possible. Literature searches were then systematically conducted in major databases including Embase, MEDLINE, PubMed and the Cochrane Database of Systematic Reviews. Results were collated and summarised into recommendation statements; these were appraised using the Grading of Recommendations Assessment, Development and Evaluations (GRADE) framework.[6] The level of evidence and strength of recommendation were provided for each statement. Although it is standard practice to align recommendations with the level of evidence, statements could receive discordant recommendations (eg, strong recommendation for low quality evidence) if, on balance, the perceived benefit outweighed the paucity of available evidence.

Consensus process

An anonymised, electronic voting process was undertaken during a face-to-face meeting to measure consensus with recommendation statements. Five Likert scale responses were provided for each statement (Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree and Strongly Agree), with Agree and Strongly Agree indicating agreement with a statement. 80%+ agreement was specified *a priori* as a threshold to accept a statement. For statements that were not accepted, up to three rounds of revisions and re-voting were permitted before they were rejected. On collation of the accepted statements, the document was sent to stakeholder groups for review. Accepted statements were then integrated into the final OGD certification pathway.

RECOMMENDATION STATEMENTS

In total, 32 recommendation statements were generated for the following domains: definition of competence (4 statements), acquisition of competence (12 statements), assessment of competence (10 statements) and post-certification support (6 statements). These are summarised in table 1.

Defining competence

1.1: Competence in diagnostic OGD is defined as the ability to perform procedures effectively and safely to national standards.
Evidence: ***Very low***; Recommendation: ***Strong***; Agreement: ***100%***

Competence in OGD refers to the ability to perform the procedure effectively and safely to defined minimum standards, across a spectrum of cases and contexts. In the UK, the individual competencies are defined within the upper GI DOPS assessment form and the minimum standards defined are stipulated within the 2017 BSG and AUGIS quality standards document.[3] It should be noted that competence does not necessarily equate with expertise; it is therefore essential for a practitioner to develop his or her skills beyond the minimum standard of competence. Competence also needs to be maintained; this may encompass a certain minimum case volume, continuous professional development and measurement of performance by key performance indicators (KPIs).

1.2: Competence in OGD will include attainment of relevant minimal performance standards as currently defined by BSG/AUGIS.
Evidence: ***Low***; Recommendation: ***Strong***; Agreement: ***100%***

1.3: Competence in OGD should include procedural completion, defined as D2 intubation and J-manoeuvre, in at least 95% of procedures.
Evidence: ***Low***; Recommendation: ***Strong***; Agreement: ***91%***

Prior to this document, JAG criteria for certification included only two measures of competence in OGD: ability to reach the second part of the duodenum unassisted in ≥95% cases, and ability to perform a J-manoeuvre unassisted in ≥95% cases. A minimum procedure number of ≥200 had also been mandated. This did not require any defined expertise or

Table 1 Summary of recommendation statements for training and certification in OGD.

	Recommendation statement	Level of evidence	Strength of recommendation
1.1	Competence in diagnostic OGD is defined as the ability to perform procedures effectively and safely to national standards.	Very low	Strong
1.2	Competence in OGD will include attainment of relevant minimal performance standards as currently defined by BSG/AUGIS.	Low	Strong
1.3	Competence in OGD should include procedural completion, defined as D2 intubation and J-manoeuvre, in at least 95% of procedures.	Low	Strong
1.4	Competence in OGD will include attainment of additional standards of performance defined in this document, including preprocedural, procedural, postprocedural and endoscopic non-technical skills.	Low	Strong
2.1	Training should take place in a unit that is accredited for endoscopy training.	Very low	Strong
2.2	Training procedures should be uploaded onto the National Endoscopy Database.	Very low	Strong
2.3	Simulation training may be used to enhance the earlier development of technical skills but cannot currently be used as a substitute for more traditional skills and decision-making training.	Moderate	Weak
2.4	Trainees should attend the JAG Basic Skills in OGD course prior to certification, ideally during early training.	Very low	Strong
2.5	Trainees should only undertake the JAG basic OGD course when continued regular training at their base unit is confirmed.	Very low	Weak
2.6	Trainees should use a wide range of resources to support OGD training.	Low	Strong
2.7	Training resources should be developed to support competency acquisition in lesion recognition.	Low	Strong
2.8	Training resources should be developed to support competency acquisition in ENTS.	Low	Strong
2.9	Trainees should have access to a wide range of case-mix to enhance training in pathology recognition, periprocedural management and ENTS.	Very low	Strong
2.10	250 procedures should be the minimum required before eligibility for summative assessment, assuming all other metrics are satisfactory.	Low	Strong
2.11	All trainers delivering training in OGD should have taken part in an endoscopy-focused Train-the-Trainers course (eg, TGT/TCT).	Low	Strong
2.12	Trainees must complete a reflection tool on JETS every 50 procedures. This forms a framework for meetings with their endoscopy supervisor every 6 months or less.	Very low	Weak
3.1	DOPS should be used as the assessment tool for competency in OGD.	Low	Strong
3.2	DOPS should be mapped to current BSG/AUGIS standards for OGD.	Very low	Strong
3.3	Total procedure times (with inspection time for surveillance procedures) should be included in the endoscopy report and assessed within DOPS.	Low	Weak
3.4	Diagnosis specific DOPS should be developed to facilitate competency acquisition and assessment for OGD, for example, Barrett's oesophagus.	Very low	Weak
3.5	DOPS should record the indication for and diagnosis of the procedure and be linked to the JETS e-portfolio/NED.	Very low	Strong
3.6	Trainees should have at least one formative DOPS performed per 10 procedures.	Low	Strong
3.7	Each formative DOPS should be performed on a single preselected case.	Very low	Strong
3.8	At least three formative DOPS from each of three different observers should be performed over the last 100 cases before summative assessment.	Low	Strong
3.9	**Eligibility for summative assessment in OGD may be triggered once the following are met:** 1. Fulfil criteria for BSG standards for competence in OGD. 2. Unassisted D2 intubation and J-manoeuvre rates of ≥95% (in the preceding 3 months). 3. Attaining a minimum hands-on procedure count of 250. 4. Attendance of JAG Basic Skills course. 5. Meeting formative DOPS requirements. – Minimum of 25 formative DOPS performed by ≥3 different assessors. – Last five DOPS rated competent without supervision for 90%+ of all items. 6. Evidence of engagement with the JETS reflection tool (minimum of 5 reflection entries).	Low	Strong
3.10	For successful completion of the summative DOPS assessment, the trainee should be rated as 'ready for independent practice' for all items within four DOPS, by two different assessors, neither of whom is their regular assessor.	Very low	Strong
4.1	Newly certified OGD practitioners should have access to a named supervisor to discuss cases and to review progress.	Very low	Strong
4.2	The ongoing training requirements of individuals should be identified and practitioners should undertake additional training/upskilling as defined within their personal development plan.	Very low	Strong
4.3	Newly certified practitioners may perform OGD without direct supervision, but should have systems in place to ensure appropriate list size and case load selection.	Very low	Strong
4.4	There should be appropriate mechanisms in place for performance monitoring and review during the early post-certification period.	Low	Strong
4.5	Significant adverse advents should be discussed with the supervisor and reflected on in their appraisal.	Very low	Strong
4.6	In the post-certification period, newly-independent endoscopists should perform at least 100 procedures a year to maintain competence.	Very low	Strong

AUGIS, Association of Upper Gastrointestinal Surgeons of Great Britain and Ireland; BSG, British Society of Gastroenterology; DOPS, direct observation of procedural skills; ENTS, endoscopic non-technical skills; JAG, Joint Advisory Group; JETS, JAG endoscopy training system; NED, national endoscopy database; OGD, oesophagogastroduodenoscopy; PD, program director; TCT, train-colonoscopy-trainer; TGT, train-gastroscopy-trainer.

assessment in pathology recognition or management. It is recognised that up to 11.3% of upper GI cancers cases may have had a previously normal OGD in the preceding 3 years.[7] This might be explained by failure to diagnose early cancers or premalignant pathology at OGD, either due to an inadequate examination,

or due to a lack of knowledge of the appearance of such pathology. In colonoscopy, there has been great emphasis on adequate mucosal visualisation to improve adenoma detection rate and reduce post-colonoscopy colorectal cancers. Although premalignant pathology in the upper GI tract is more variable, and the pathways less well defined than the colorectal adenoma–carcinoma sequence, there is an opportunity to detect more relevant pathology than is currently the case.[8 9] To address this issue, the BSG and AUGIS standards were published in 2017 with defined minimum and aspirational standards.[3] The JAG OGD standards will be aligned with these minimum standards for competent practice.

1.4: Competence in OGD will include attainment of additional standards of performance defined in this document, including preprocedural, procedural, postprocedural and endoscopic non-technical skills.
Evidence: ***Low***; Recommendation: ***Strong***; Agreement: ***100%***

In addition to technical endoscopic competencies, all trainees should be competent in peri-procedural aspects of endoscopy. These may be preprocedural (to include consent, sedation, etc), procedural (technical and cognitive elements), postprocedural (eg, report writing) and endoscopic non-technical skills (ENTS). These aspects are measured and detailed within direct observation of procedural skills (DOPS) assessments, which include descriptors of the expected levels of competency.

Acquiring competence

2.1: Training should take place in a unit that is accredited for endoscopy training.
Evidence: ***Very low***; Recommendation: ***Strong***; Agreement: ***100%***

There are no published data specifically related to outcomes in training related to JAG-accreditation status of units. However, the processes of quality assurance (QA) of both service and training remain integral to the overall JAG quality framework. The JAG QA process assesses endoscopy units on criteria specifically related to training and the training environment; engagement and benchmarking ensures that standards are maintained and improved.[10]

Despite full JAG accreditation, some units will have difficulties providing all the required training to the trainees on site, depending on the number of trainees and subspecialties. In the UK, other specialties such as radiology and histopathology have pioneered a more centralised academy-style training programme with organised training focused in one area, but with planned networked exposure in other units. Such a system has been used in advanced endoscopy. Full implementation of academy-based training may be challenging for UK gastroenterology trainees due to the competing non-endoscopy demands.[5 11] A more centralised, organised programme may allow more equitable access to training and experiences. In all situations, a full record of training cases should be maintained by the trainee and all training units within a training network should be JAG accredited.

2.2: Training procedures should be uploaded onto the National Endoscopy Database.
Evidence: ***Very low***; Recommendation: ***Strong***; Agreement: ***100%***

The establishment and evolution of the National Endoscopy Database (NED) is an important initiative for UK endoscopy.[12] The data from NED will be used to populate trainees' individual portfolios and ultimately reduce the time required to develop the trainees' JETS portfolios. Accuracy of data input will be essential for accurate recording of training and both trainers and trainees will need to ensure that procedures performed outside the normal endoscopy environment (eg, emergencies in theatre) are captured accurately.

2.3: Simulation training may be used to enhance the earlier development of technical skills but cannot currently be used as a substitute for more traditional skills and decision-making training.
Evidence: ***Moderate***; Recommendation: ***Weak***; Agreement: ***82%***

Prospective randomised controlled studies have shown that endoscopic simulation-based training (SBT) can significantly enhance the trainee performance.[13–17] This is most evident in the early part of the learning curve for novices and improves scope handling skills.[17] There is no evidence to show that simulation training significantly impacts the rate of acquisition of the more complex cognitive and management tasks,[18] or that simulation reduces the overall number of procedures required to reach overall competence.[19] However, a case–control study of novice endoscopists from the UK found that attendees of a 2-day OGD induction course combining theory and SBT were more likely to achieve JAG certification over the 16-month post-course follow-up period.[20] While simulation enhances the early acquisition of technical skills, it should not substitute patient-based endoscopy training.[21] Such training should be supervised and be associated with specific performance enhancing feedback.[22 23]

2.4: Trainees should attend the JAG Basic Skills in OGD course prior to certification, ideally during early training.
Evidence: ***Very low***; Recommendation: ***Strong***; Agreement: ***91%***

Mandated endoscopy courses are necessary aspects of endoscopy training and skill acquisition that have been stipulated by JAG.[24] The JAG Basic Skills in OGD course provides a uniform, structured introduction to OGD, including issues related to indications, safety, ergonomics,[25] scope handling,[26] sedation and background knowledge. It has been updated to incorporate the additional standards recommended by BSG/AUGIS.[3] Other forms of education, including e-learning resources, can enhance acquisition of cognitive skills such as lesion recognition. The JAG QAT Working Group will continue to provide quality assurance of the basic skills course to ensure consistency, validity and currency. Based on colonoscopy data, Basic Skills courses appear to be more useful when attended early during training, that is, probably between 20–70 cases overall.[27] As a point of good practice, the trainees, in discussion with their trainers, should plan the timing of the course, within the context of their own personal development plan before starting OGD training. This discussion may well often involve those with a wider remit overseeing the trainees' progress, particularly regional programme directors.

2.5: Trainees should only undertake the JAG basic OGD course when continued regular training at their base unit is confirmed.
Evidence: ***Very Low***; Recommendation: ***Weak***; Agreement: ***82%***

The Basic Skills Course functions as a complement to continued training at base hospitals and it is important that trainees have the opportunity to reinforce their learning from the course with regular hands-on training. The Basic Skills Course should be undertaken when access to training can be continued over the subsequent 3 months at a minimum, with at least one post-course training-list per week.

2.6: Trainees should use a wide range of resources to support OGD training.
Evidence: ***Low***; Recommendation: ***Strong***; Agreement: ***100%***

Training on dedicated, purpose-specific lists can improve skills acquisition in endoscopy, as shown by the improvement in dysplasia detection rate and reduction in bleeding and perforation rates in comparison to those without formal training.[28 29] A variety of other educational resources such as e-learning systems can be beneficial.[30] BEST-Academia is a European web-based training platform designed by an expert committee and has been shown to increase detection and delineation of neoplastic lesions in Barrett's oesophagus.[31] Online tools, textbooks, journals, live endoscopy demonstrations, conferences and hospital multidisciplinary teams (MDTs) and teaching sessions can all contribute to the gaining of competence in trainees. Although resources can be sign-posted, it would be counterproductive to be too prescriptive. Similarly, it is important that any resources developed for, or advocated to support, learners within JAG-associated programmes are suitably focused on trainee and patient outcomes. This will need to encompass a suitably broad range of endoscopy cases to maximally enhance pathology recognition, decision-making and ENTS.

2.7: Training resources should be developed to support competency acquisition in lesion recognition.
Evidence: ***Low***; Recommendation: ***Strong***; Agreement: ***100%***

2.8: Training resources should be developed to support competency acquisition in ENTS.
Evidence: ***Low***; Recommendation: ***Strong***; Agreement: ***100%***

2.9: Trainees should have access to a wide range of case-mix to enhance training in pathology recognition, periprocedural management and ENTS.
Evidence: ***Very low***; Recommendation: ***Strong***; Agreement: ***100%***

While acquisition of purely technical OGD skills occurs relatively quickly, it takes longer, and a greater number of procedures, to develop the essential skills of lesion recognition, management and ENTS.[32 33] Currently, the majority of OGD training involves elective outpatient cases, where the incidence of pathology is low. Each trainee should be encouraged to enhance ENTS competency, especially in lesion recognition. Trainers and training units (as well as JAG) are encouraged to develop resources to enhance the development of these skills. Over time, training lists should expand their case-mix to enhance training in pathology recognition and management of a wide range of diagnostic cases, while developing ENTS. This may involve a variety of endoscopy trainers or purpose-specific endoscopy training lists.

There are no data on which to inform any recommendations on desirable timescales for the acquisition of competence in OGD. This is influenced by many variables, including intensity of training.[34] Therefore, more intensive training may be favoured within the context of continuous longitudinal endoscopy training, but may not be readily possible in the context of other competing demands for many trainees. The minimum exposure to training should be one specific training list per week. This training list should have the content and number of cases adjusted for the trainee's development, and importantly include time for feedback and DOPS.

It is accepted that ENTS are important for the safe and effective performance of endoscopy. In the UK, acquisition of these skills lags behind the development

of the technical skills of scope control.[33] Specific courses and teaching on ENTS has been shown to enhance short-term knowledge performance and recognition of these skills in expert endoscopists and teams.[35] Short-term ENTS training, in conjunction with simulation in novices, has been shown to enhance colonoscopy performance and may be generalisable to OGD.[36]

2.10: 250 procedures should be the minimum required before eligibility for summative assessment, assuming all other metrics are satisfactory.
Evidence: ***Low***; Recommendation: ***Strong***; Agreement: ***100%***

JAG has previously mandated a minimum of 200 OGD procedures as an eligibility criterion for certification. This was based on earlier studies that found that procedural completion can be achieved within this number. Using the GAGES-UE tool for assessment (which measures only clear technical skills), Vassiliou *et al* suggested that the gross technical skills were obtainable by 50 cases.[37] A prospective, cross-sectional study by Cass *et al* concluded that gastroenterology and surgical trainees require more than 100 procedures to reach >90% oesophageal intubation rate.[38] An earlier UK study found that 187 procedures were required to reach competency in D2 intubation.[39] However it is clear that the more complex cognitive and pathology managements skills take longer to acquire than the technical skills required for procedural completion. More recent data from the USA and the UK confirm that the acquisition of the postprocedure technical, cognitive skills and overall global competency often requires 250 or more procedures.[32 33] Reliable accurate pathology recognition takes longer, requiring 300 procedures in 90% of cases.[32] Overall competency, including postprocedure management, was not reached until 225–249 procedures, although preprocedure competencies such as indication and sedation were developed much earlier (100–124 procedures).[33] Technical skills including adequate visualisation of the stomach were acquired at an intermediate rate (150–174 procedures). Therefore, although technical competencies seem to be acquired relatively rapidly, the skills essential for patient management such as ENTS, report writing, pathology recognition and post-endoscopic management require longer.[32 33] From JAG certification data,[5] the median number of OGD procedures at the time of summative assessment was 282 (ranging between 245–305 for different specialties), suggesting that most trainees feel comfortable applying for certification after performing considerably more than 200 procedures to gain confidence in the more complex cognitive and management aspects of OGD. Accordingly, the panel recommends that all trainees should have a minimum of 250 hands-on OGD procedures to be eligible for summative assessment.

2.11: All trainers delivering training in OGD should have taken part in an endoscopy-focused Train-the-Trainers course (eg, TGT/TCT).
Evidence: ***Low***; Recommendation: ***Strong***; Agreement: ***100%***

Endoscopy training should ideally be provided by individuals with the requisite skills and behaviours to teach endoscopy effectively, including an awareness of the principles of adult education, best practices in procedural skills education and appropriate use of beneficial educational strategies such as feedback.[10 40 41] Trainers in OGD should have appropriate training for their role and undertake regular performance review. Ideally, all trainers will have completed an endoscopy-focused Train-the-Trainer's (TTT) course. It is aspirational for trainers to have at least annual appraisal of training performance from peers and trainees,[42] and undertake formal update training, either as a refresher trainer session or as faculty on a Basic Skills Course, every 5 years. Throughout the UK, many endoscopy trainers provide training in more than one modality. Although attending a Train-Gastroscopy-Trainer (TGT) course is desirable, there is considerable overlap in the educational content of other procedure-specific TTT courses which are transferable to OGD training, and as such, having these credentials would be considered sufficient as an OGD trainer.

There is limited evidence on the effects of training-the-trainer in endoscopy; however studies in the field of surgery have shown that formal training of trainers can result in a significantly higher rating by their learners.[43] Having more than one trainer can be beneficial in providing complimentary training and maximising training opportunities. Each trainee should have a specific endoscopy trainer who would directly oversee their development, conduct regular appraisal of progress and plan and document training objectives. This provides the opportunity to discuss learning from adverse events and complications. Appraisal meetings for trainees should take place at least once every 3 months.

2.12: Trainees must complete a reflection tool on JETS every 50 procedures. This forms a framework for meetings with their endoscopy supervisor every 6 months or less
Evidence: ***Very low***; Recommendation: ***Weak***; Agreement: ***100%***

Reflective practice is 'the process whereby an individual thinks analytically about anything

relating to their professional practice with the intention of gaining insight and using the lessons learnt to maintain good practice or make improvements where possible'.[44] As part of endoscopy training, concurrent (while performing the procedure) and facilitative (delayed feedback or debriefing) techniques may be used. Facilitative feedback is particularly used to help the trainee reflect on what happened, analyse performance and recognise areas of strength and those that need improvement. While students mastering early skills seem to be benefitting from concurrent feedback, performance and learning are enhanced by delayed feedback.[40 45] Reflective practice is already established in medical and nursing training and in the post-qualification appraisal process, but has not been formalised within endoscopy training.

The use of reflection in practice has been linked to improvements in learning and improve patient safety.[46] The opportunity to consolidate learning and identify opportunities to improve technique or patient care integrates cognitive and non-cognitive skills,[47] drawing together elements of best practice from the available literature, tailored to the patient and case. Such reflections allow the inclusion of feedback and learning outcomes from the wider endoscopy team, with focus on the patient and not only on the trainees' experience. Therefore, it is recommended that reflective learning becomes formalised into the OGD training process.

Assessment of competence

3.1: DOPS should be used as the assessment tool for competency in OGD.
Evidence: ***Low***; Recommendation: ***Strong***; Agreement: ***100%***

The UK upper GI endoscopy DOPS is a validated tool for assessing competency in upper GI endoscopy. It comprises 34 individual competency items split into six domains, including ENTS. In a UK-wide study involving over 10 000 DOPS assessments by 987 trainees, data on the validity and reliability of DOPS were presented, along with learning curves, competency benchmarks and predictors of competency.[33 48] From generalisability theory analyses, satisfactory reliability thresholds could be achieved based on different combinations of assessors and assessments.[33]

3.2: DOPS should be mapped to current BSG/AUGIS standards for OGD.
Evidence: ***Very Low***; Recommendation: ***Strong***; Agreement: ***100%***

Given that best practice standards in upper GI endoscopy have been stipulated within UK guidelines and endorsed by stakeholder societies,[3] the consensus of the working group was to map existing UK upper GI endoscopy standards with those assessed within DOPS to align quality standards with competency measures (online supplemental table 1).

3.3: Total procedure times (with inspection time for surveillance procedures) should be included in the OGD report and assessed within DOPS.
Evidence: ***Low***; Recommendation: ***Weak***; Agreement: ***100%***

The total OGD procedure time has been shown to correlate with diagnostic yield, and a minimum time of 7 min has been suggested in European guidelines.[49 50] This ensures sufficient time for thorough inspection, washing and the application of antispasmodics and mucolytics where appropriate.[51] The UK BSG/AUGIS standards recommend noting total procedure time for all surveillance procedures; this should be included in the endoscopy report and assessed within DOPS.

3.4: Diagnosis specific DOPS should be developed to facilitate competency acquisition and assessment for OGD, for example, Barrett's oesophagus.
Evidence: ***Very Low***; Recommendation: ***Weak***; Agreement: ***91%***

Surveillance of Barrett's oesophagus is considered a high-risk indication. A systematic review by Visrodia *et al* cited a 1-year PEUGIC rate of 25%.[52] In recognition of the technical nuances in Barrett's surveillance (eg, mucosal inspection, usual of adjunct, dysplasia assessment, biopsies), the panel favoured the development of formative DOPS specific to Barrett's surveillance to facilitate competency assessment and to ultimately improve endoscopic quality and reduce PEUGIC rates with Barrett's oesophagus.

3.5 DOPS should record the indication for and diagnosis of the procedure and be linked to the JETS e-portfolio/NED.
Evidence: ***Very low***; Recommendation: ***Strong***; Agreement: ***91%***

All UK trainees in GI endoscopy are required to register and log training data onto the JETS e-portfolio. This generates KPIs which act as a surrogate measure of competence. The NED project aims to upload trainee-level procedural data from individual endoscopy reporting systems directly to the JETS e-portfolio for QA purposes.[12] This includes procedure-specific outcome data necessary for KPI calculations, for example, indications, diagnoses, therapeutic data, sedation and complications. The OGD DOPS are recorded separately on JETS but do not contain procedural outcome data. Where appropriate, assessment data from DOPS should be linked to procedural outcome data to facilitate QA and research in OGD training.

3.6 Trainees should have at least one formative DOPS performed per 10 procedures.
Evidence: ***Low***; Recommendation: ***Strong***; Agreement: ***91%***

The provision of performance-enhancing feedback is central to supervised endoscopy training and is embedded in the JAG TTT philosophy. The DOPS provide an essential means for focusing the feedback related to procedures as well as mapping out the learning and development curve for the trainee.[45] We recommend for a minimum of one DOPS every 10 cases during training. Trainees and trainers are however encouraged to do as many as they feel appropriate.

3.7 Each formative DOPS should be performed on a single preselected case.
Evidence: ***Very low***; Recommendation: ***Strong***; Agreement: ***100%***

To minimise selection bias, each DOPS should be performed on a single case prespecified by the trainee or trainer. DOPS should not be retrospectively chosen on a completed case or averaged across cases performed on a list.

3.8 At least three formative DOPS from each of three different observers should be performed over the last 100 cases before summative assessment.
Evidence: ***Low***; Recommendation: ***Strong***; Agreement: ***82%***

Data from the JETS database shows that the reliability of the DOPS varied with the number of observers and the number of DOPS.[33] DOPS from at least three observers are required for adequate reliability for determining competence. Therefore, it is recommended that at least nine DOPS in total, with at least three different observers, be performed in the last 100 cases before deciding to continue to summative assessment. Based on existing requirements, trainees should be competent in the last five DOPS in a minimum of 90% of all assessed items, with none requiring maximal or significant supervision.

Based on the recommendation statements within this document, trainees will only be eligible for summative assessment when they have fulfilled the criteria above (figure 1).

3.9: Eligibility for summative assessment in OGD may be triggered once the following are met:

1. Fulfil criteria for BSG standards for competence in OGD.
2. Unassisted D2 intubation and J-manoeuvre rates of ≥95% (in the preceding 3 months).
3. Attaining a minimum hands-on procedure count of 250.
4. Attendance of JAG Basic Skills course.
5. Meeting formative DOPS requirements.
   - Minimum of 25 formative DOPS performed by ≥3 different assessors.
   - Last five DOPS rated competent without supervision for 90%+ of all items.
6. Evidence of engagement with the JETS reflection tool (minimum of five reflection entries).

Evidence: **Low**; Recommendation: **Strong**; Agreement: **100%**

3.10: For successful completion of the summative DOPS assessment, the trainee should be rated as 'ready for independent practice' for all items within four DOPS, by two different assessors, neither of whom is their regular assessor.
Evidence: ***Very low***; Recommendation: ***Strong***; Agreement: ***100%***

All JAG certification pathways require trainees to undertake summative assessment in order to provide robust and objective demonstration of competence to determine readiness for independent practice. To mitigate bias, trainees must perform a total of four summative OGD DOPS and be rated competent in all items by two different assessors, none of whom should be their current main assessor. Assessors should have trainer credentials and should have received formal training in assessing DOPS.

Post-certification support

4.1: Newly certified OGD practitioners should have access to a named supervisor to discuss cases and to review progress.
Evidence: ***Very Low***; Recommendation: ***Strong***; Agreement: ***100%***

In the post-certification period, it is recognised that most newly certified practitioners will require a defined period of supervision (eg, 1 year) and ongoing endoscopy exposure to achieve the outcomes of an experienced practitioner.[53 54] As such, a newly-certified practitioner should have access to a named supervisor who can review progress and provide advice where needed. Instances where support may be beneficial may include: review of photodocumentation (and indeterminate lesions) and postprocedural management plans. We recommend that such arrangements should be made with a named supervisor on a regular basis to safeguard patient management and to facilitate skills development. The supervisor should possess valid trainer credentials, that is, recognised OGD trainer and have attended a TTT course.

4.2: The ongoing training requirements of individuals should be identified and practitioners should undertake additional training/upskilling as defined within their personal development plan.
Evidence: ***Very Low***; Recommendation: ***Strong***; Agreement: ***100%***

In endoscopy, the path from competent to high-quality practice involves an ongoing learning curve post-certification. We recommend that, as part of professional

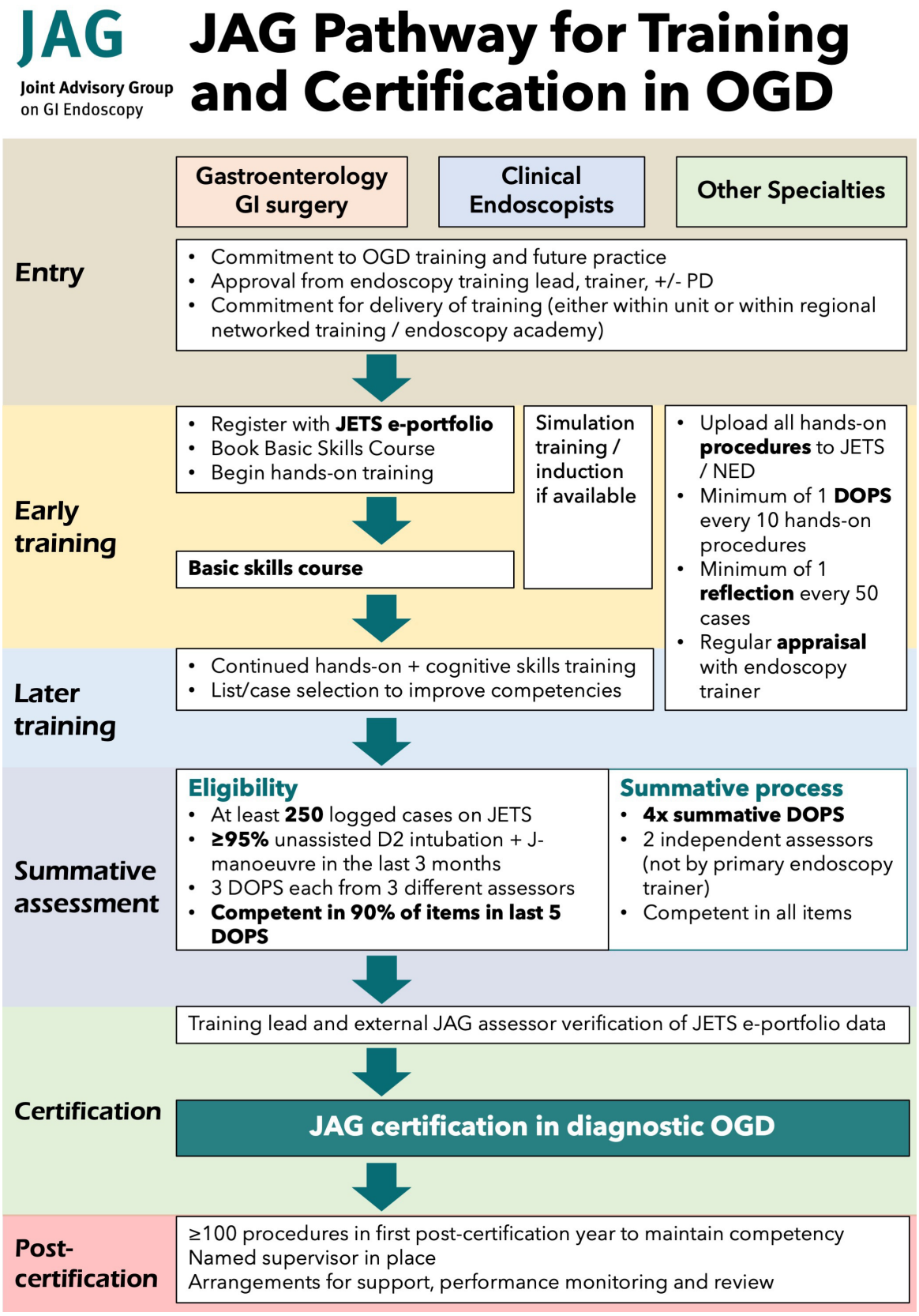

Figure 1 Proposed JAG pathway for training and certification in OGD. DOPS, direct observation of procedural skills; GI, gastrointestinal; NED, National Endoscopy Database; OGD, oesophagogastroduodenoscopy; PD, program director

development, the training requirements of newly-certified endoscopists should be identified, discussed and recorded. For OGD, this could include lesion characterisation training, for example, Barrett's surveillance, and training in therapeutic modalities, for example, upper GI bleed haemostasis, oesophageal dilatation. This should include plans for supporting underperformance if self-reported or observed during the newly independent period, in line with JAG guidance.[55] Practitioners should also be encouraged to attend upper GI MDT meetings at least on an ad hoc basis.

4.3: Newly certified practitioners may perform OGD without direct supervision, but should have systems in place to ensure appropriate list size and caseload selection.
Evidence: ***Very Low***; Recommendation: ***Strong***; Agreement: ***100%***

During newly-independent practice, it is possible that the cessation of directly supervised practice can lead to a drop in performance.[56] An analysis of completion metrics recorded on the UK trainee e-portfolio found a small but statistically significant decrement in mean D2 intubation and J-manoeuvre rates in the 3 months pre-certification versus post-certification.[5] We suggest that, in the immediate post-certification period, there should be systems in place to ensure that list size and caseload selection is tailored to the practitioner. Existing JAG guidelines (predating COVID-19) recommend for a standard diagnostic OGD to be allocated a minimum of 20 min; this may need to be increased in the immediate post-certification period.

We recommend that complex cases, for example, acute upper GI bleeding, known therapeutic intent, previous intubation failure,[57] American Society of Anaesthesiologists grade 3+ or patients on the intensive care unit, should not be independently performed by the new-certified endoscopist unless deemed competent by a supervisor/training lead. Newly-certified practitioners should be able to review the caseload and volume on their list to ensure appropriateness, to anticipate issues and for time management purposes. This is a prerequisite for checklists and effective team briefing and should be considered part of the non-technical skills repertoire.[58 59]

4.4: There should be appropriate mechanisms in place for performance monitoring and review during the early post-certification period.
Evidence: ***Low***; Recommendation: ***Strong***; Agreement: ***100%***

The recent implementation of the UK NED enables key performance indicators in OGD to be collected centrally and benchmarked against national quality standards to quality assure endoscopy practice.[12] In according with JAG recommendations for quality assurance of services, performance data of newly-certified practitioners should be subjected to review at regular intervals to enable practitioners to discuss queries, concerns or issues with caseload or time management.

4.5: Significant adverse advents should be discussed with the supervisor and reflected on in their appraisal.
Evidence: ***Very Low***; Recommendation: ***Strong***; Agreement: ***100%***

Complications during OGD are rare but may be more common in interventional procedures performed by trainees.[60] All significant adverse events, that is, perforation, bleeding, missed cancer, postprocedural readmissions and mortality, should be discussed locally at an endoscopy governance meeting. In cases where adverse events are deemed to be avoidable through technical or non-technical factors attributable to the endoscopist, such cases should be formally reflected on and discussed in appraisals involving their supervisor.

4.6: In the post-certification period, newly-independent endoscopists should perform at least 100 procedures a year to maintain competence.
Evidence: ***Very Low***; Recommendation: ***Strong***; Agreement: ***100%***

The BSG/AUGIS quality standards document suggests for each endoscopist to perform at least 100 OGDs per year to maintain proficiency and prevent skills decay.[3] Evidence for this has been inferred from colonoscopy practice.[34] Although it is acknowledged that practitioners within training programmes may struggle to achieve such a volume due to conflicting commitments, endoscopy services and training programmes should strive to enable newly-independent practitioners to achieve such a volume in line with national guidance.

DISCUSSION

Adequate training in upper GI endoscopy is essential for procedural effectiveness, patient comfort and safety. Studies on PEUGIC from the UK and internationally have demonstrated a need to improve performance in diagnostic OGD. While there has been a structured training programme for competence in OGD in the UK for over a decade, we have been learning from this in order to improve the training experience for trainees and patients. This has been facilitated by the publication of BSG/AUGIS standards for OGD, and by evaluation of training methodologies and outcomes. Since the release of the first OGD certification document, training in OGD has evolved to include added focus on ENTS, lesion recognition, inspection technique, competency assessment and quality assurance of the training process itself.

Due to the limited available evidence, the nature of training studies and the rigours of GRADE, we acknowledge that much of the cited studies were of

very-low to low quality evidence. The rationale for these recommendations lie within the relevant sections of this document. This revised curriculum has incorporated published evidence related to training, but has also provided expert consensus where evidence is lacking but deemed to be important to the OGD training pathway. Future study and evaluation of the recommended measures will be required and will be facilitated by data from JETS and NED.

Although COVID-19 has had a profound effect on endoscopy training,[61] the safety of trainees as well as patients remain paramount. Infection prevention measures will need to be adhered to in training situations, but the criteria set out in this curriculum document will remain unchanged.

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Supplementary Table 1: Comparison of BSG/AUGIS Quality Standard to current upper gastrointestinal DOPS. *Green: compatible, Amber: to modify existing DOPS, Red: add new DOPS descriptor, Blank: not applicable*

Quality Standard	DOPS parameter(s)	Adequate mapping	Recommendations
Patients should be assessed for fitness to undergo a diagnostic OGD	Pre-Procedure - Indication • Assesses the appropriateness of the procedure and considers possible alternatives Pre-Procedure - Risk Assessment • Assesses co-morbidity including drug history • Assesses any procedure related risks relevant to patient • Takes appropriate action to minimise any risks	Y	No recommendation
Patients should receive appropriate information about the procedure before undergoing an OGD	Pre-Procedure - Confirms consent • Complete and full explanation of the procedure including proportionate risks and consequences without any significant omissions and individualised to the patient	Y	No recommendation
An appropriate time slot should be allocated dependent on procedure indications and patient characteristics	Procedure - Pace and Progress • Completes whole procedure in reasonable and appropriate time, without rushing and without unduly prolonging the procedure	Partial	Make explicit in Pre-procedure - Preparation • Ensure adequate time allocated for procedure
Informed consent should be obtained before performing an OGD	Pre-Procedure - Confirms Consent • Early in training the consent process should be witnessed by the trainer, once competent it is acceptable for the trainee to confirm that valid consent has been gained by another trained person. • During the summative DOPS the process of obtaining consent should witnessed and assessed • Complete and full explanation of the procedure including proportionate risks and consequences without any significant omissions and individualised to the patient • Avoids the use of jargon • Does not raise any concerns unduly • Gives an opportunity for patient to ask questions by adopting	Y	No recommendation

	appropriate verbal and non-verbal behaviours • Develops rapport with the patient • Respects the patient's own views, concerns and perceptions		
A safety checklist should be completed before starting an OGD	Pre-Procedure - Preparation • Ensures all appropriate pre-procedure checks are performed as per local policies	Y	No recommendation
A checklist should be undertaken after completing an OGD, before the patient leaves the room	ENTS - Leadership • Supports safety and quality by adhering to current protocols and codes of clinical practice	Partial	Add to Post-Procedure • Completes sign-out of Checklist
Only an endoscopist with appropriate training and the relevant competencies should independently perform OGD	ENTS - Leadership • Supports safety and quality by adhering to current protocols and codes of clinical practice BSG Quality and Safety Indicators -Staffing • Only staff assessed to be competent for that task are allowed to practice without supervision	Implicit in DOPS	No recommendation
We suggest that endoscopists should aim to perform a minimum of 100 OGDs a year, to maintain a high-quality examination standard	N/A	Post-Accreditation	No recommendation
UGI endoscopy should be performed with high-definition video endoscopy systems, with the ability to capture images and take biopsies	Pre-Procedure - Equipment Check • Ensures the available scope is appropriate for the current patient. • Ensures the endoscope is functioning normally before attempting insertion checking all channels and connections, light source and angulation locks are off.	Partial	No recommendation - beyond scope of DOPS
Intravenous sedation and local anaesthetic throat spray can be used in conjunction if required. Caution should be exercised in those at risk of aspiration	Pre-Procedure - Sedation • When indicated inserts and secures IV access and uses appropriate topical anaesthesia • Uses sedation and/or analgesic doses in keeping with current guidelines and in the context of the physiology of the patient • Drug doses checked and confirmed with the assisting staff	Y	No recommendation
A complete OGD should assess all relevant anatomical landmarks and high-risk stations	Visualisation	Y	No recommendation

Photodocumentation should be made of relevant anatomical landmarks and any detected lesions		N	Add in Procedure - Visualisation Photodocuments landmarks and lesions according to current guidelines
The quality of mucosal visualisation should be reported.	Post-Procedure - Report Writing • Records a full and accurate description of procedure and findings	Partial	Add in Report Writing • Includes quality of mucosal visualisation
Adequate mucosal visualisation should be achieved by a combination of adequate air insufflation, aspiration and the use of mucosal cleansing techniques	Insertion and Withdrawal - Suction/Air/lens cleaning • Well-judged and timely use of distension, suction and lens clearing.	Partial	Add in Insertion and Withdrawal • Uses mucosal cleaning techniques
It is suggested that the inspection time during a diagnostic OGD should be recorded for surveillance procedures, such as Barrett's oesophagus and gastric atrophy/intestinal metaplasia surveillance		N	Add in Report Writing • Reports inspection time for surveillance procedures
Where a lesion is identified, this should be described using the Paris classification and targeted biopsies taken	Post-Procedure - Report Writing • Uses appropriate endoscopy scoring systems	Y	No recommendation - DOPS parameters generic to cover multiple situations
Endoscopy units should adhere to safe sedation practice	N/A		
The length of a Barrett's segment should be classified according to the Prague classification	Post-Procedure - Report Writing • Uses appropriate endoscopy scoring systems	Y	No recommendation - DOPS parameters generic to cover multiple situations
Where a lesion is identified within a Barrett's segment, this should be described using the Paris classification and targeted biopsies taken	Post-Procedure - Report Writing • Uses appropriate endoscopy scoring systems	Y	No recommendation - DOPS parameters generic to cover multiple situations
When no lesions are detected within a Barrett's segment, biopsies should be taken in accordance with the Seattle protocol If squamous neoplasia is suspected, full assessment with enhanced imaging and/or Lugol's chromo-endoscopy is required	Management of Findings - Management • Takes appropriate specimens as indicated by the pathology and clinical context. Recognition • Appropriate use of mucosal enhancement techniques.	Y	No recommendation - DOPS parameters generic to cover multiple situations
Oesophageal ulcers and oesophagitis that is grade D or atypical in appearance, should be biopsied, with further evaluation in 6 weeks after PPI therapy	Management of Findings - Management • Takes appropriate specimens as indicated by the pathology and clinical context. Post-Procedure - Management • Records an appropriate	Y	No recommendation - DOPS parameters generic to cover multiple situations

	management plan (including medication, further		
The presence of an inlet patch should be photo-documented. The presence of a hiatus hernia should be documented and measured	Management of Findings - Recognition • Rapid, accurate and thorough determination of normal and abnormal findings. Post-Procedure - Report Writing • Records a full and accurate description of procedure and findings • Uses appropriate endoscopy scoring systems	Partial	Add in Management of Findings - Recognition • Photodocuments abnormal findings
Biopsies from two different regions in the oesophagus should be taken to rule out eosinophilic oesophagitis in those presenting with dysphagia/food bolus obstruction, where an alternate cause is not found	Management of Findings - Management • Takes appropriate specimens as indicated by the pathology and clinical context.	Y	No recommendation - DOPS parameters generic to cover multiple situations
Varices should be described according to a standardised classification	Post-Procedure - Report Writing • Records a full and accurate description of procedure and findings • Uses appropriate endoscopy scoring systems	Y	No recommendation - DOPS parameters generic to cover multiple situations
Strictures should be biopsied to exclude malignancy before dilatation	Management of Findings - Management • Takes appropriate specimens as indicated by the pathology and clinical context. • Performs endoscopic therapy or interventions appropriately for the pathology and clinical context (includes taking no action)	Y	No recommendation - DOPS parameters generic to cover multiple situations
Gastric ulcers should be biopsied and re-evaluated after appropriate treatment, including *H. pylori* eradication where indicated, within 6–8 weeks	Management of Findings - Management • Takes appropriate specimens as indicated by the pathology and clinical context. Post-Procedure - Management • Records an appropriate management plan (including medication, further investigation and responsibility for follow-up).	Y	No recommendation - DOPS parameters generic to cover multiple situations
Where there are endoscopic features of gastric atrophy or IM separate biopsies from the gastric antrum and body should be taken	Management of Findings - Management • Takes appropriate specimens as indicated by the pathology and clinical context.	Y	No recommendation - DOPS parameters generic to cover multiple situations
Where iron deficiency anaemia is	Management of Findings - Management	Y	No recommendation - DOPS

being investigated, separate biopsies from the gastric antrum and body should be taken, as well as duodenal specimens if coeliac serology is positive or has not been previously measured	• Takes appropriate specimens as indicated by the pathology and clinical context.		parameters generic to cover multiple situations
Where gastric or duodenal ulcers are identified, *H. pylori* should be tested and eradicated if positive	Management of Findings - Management • Takes appropriate specimens as indicated by the pathology and clinical context.		
The presence of gastric polyps should be recorded, with the number, size, location and morphology described, and representative biopsies taken	Post-Procedure - Report Writing • Records a full and accurate description of procedure and findings • Uses appropriate endoscopy scoring systems Management of Findings - Management • Takes appropriate specimens as indicated by the pathology and clinical context.	Y	No recommendation - DOPS parameters generic to cover multiple situations
Where coeliac disease is suspected, a minimum of four biopsies should be taken, including representative specimens from the second part of the duodenum and at least one from the duodenal bulb	Management of Findings - Management • Takes appropriate specimens as indicated by the pathology and clinical context.	Y	No recommendation - DOPS parameters generic to cover multiple situations
A malignant looking lesion should be described, photo documented and a minimum of six biopsies taken	Post-Procedure - Report Writing • Records a full and accurate description of procedure and findings • Uses appropriate endoscopy scoring systems Management of Findings - Management • Takes appropriate specimens as indicated by the pathology and clinical context.	Partial	Add in Management of Findings - Recognition • Photodocuments abnormal findings
After OGD readmission, mortality and complications should be audited	N/A		
A report summarising the endoscopy findings and recommendations should be produced and the key information provided to the patient before discharge	Post-Procedure - Report Writing • Records a full and accurate description of procedure and findings ENTS – Communication & Teamwork • Clear communication of results and management plan with patient and/or carers	Y	No recommendation
A method for ensuring histological results are processed must be in	N/A		

place			
Endoscopy units should audit rates of failing to diagnose cancer at endoscopy up to 3 years before an oesophago-gastric cancer is diagnosed	N/A		