

JETS JAG Endoscopy
Training System

JAG certification
Capsule endoscopy
(small bowel)

Part of the JAG programme at the RCP

JAG Joint Advisory Group
on GI Endoscopy



**Royal College
of Physicians**

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Introduction

Summary

The utilisation of capsule endoscopy (CE) is increasing in the United Kingdom, as a result there is a need for a formalised training and certification pathway in keeping with other gastrointestinal endoscopic procedures. While there is a paucity of evidence base on which to guide development of the pathway, guidelines exist from both European societies and the USA. The pathway described here is based on the ASGE training guidance and the available evidence.

The pathway and its components have been designed to recognise the multi-professional workforce providing CE reporting and is applicable to all professional groups.

The certification pathway incorporates:

- e-learning resources
- capsule endoscopy specific course
- formative Directly Observed Procedures (DOPs) assessments
- single best answer knowledge-based assessment
- summative DOPs

Background

The demand for capsule endoscopy services in the UK is increasing year on year and there is a demand from trainees for a training programme in capsule endoscopy (1).

Small bowel capsule endoscopy (SBCE) is frequently used to investigate small bowel pathology and is the diagnostic test of choice following a negative gastroscopy and colonoscopy in the investigation of obscure GI bleeding as per British Society of Gastroenterology (BSG) guidelines (7) and the European Society of Gastrointestinal Endoscopy guidelines (8). It is used in the investigation of iron deficiency anaemia where no gastric or colonic cause has been found and in patients with chronic diarrhoea. It is also useful in the investigation of suspected and established small bowel Crohn's disease and in certain circumstances useful in the assessment of the complications of coeliac disease, surveillance of polyposis syndromes and in identification of small bowel tumours e.g. primary adenocarcinoma, gastro-intestinal stromal tumours and primary small bowel neuroendocrine tumours.

One of the Joint Advisory Group in Gastrointestinal Endoscopy's (JAG) core objectives is to agree and set acceptable standards for competence in endoscopic procedures and where possible to use an evidence-based approach to determining training and accreditation processes for all endoscopic procedures. Given the wide availability of, and increasing demand for, SBCE, the development of guidance on training and certification is timely. While specific small bowel capsule endoscopy courses have existed in the UK for some time, there is no established training or certification structure.

Aims and objectives

- JAG Certification in capsule endoscopy will demonstrate that a practitioner has covered a core curriculum comprising the recognition of common and important small bowel disease and demonstrated global competence (i.e. both cognitive and technical competence) to manage patients in the event they need a capsule endoscopy.
- JAG Certification standards are designed to ensure that a defined clinical standard has been achieved that is in line with evidence-based indicators for independent practitioners.
- JAG Certification standards in capsule endoscopy and the training pathway seek to provide necessary training and evidence safe practice in all aspects of performing capsule endoscopy (small bowel) including the use of the patency capsule, endoscopic placement of the capsule and capsule reading and reporting.
- The recommended capsule endoscopy (small bowel) training pathway comprises both centrally delivered via e-Learning and JAG approved capsule courses and locally delivered hands-on training. Trainers and trainees are supported by JAG Capsule DOPS forms and the JETS e-Portfolio to provide evidence of competency

Certification criteria

Eligibility criteria

Before starting training in Capsule endoscopy, an individual should be meeting the following eligibility criteria.

- Be registered with a regulatory body (GMC / NMC / HCPC)
- Demonstration of experience of endoscopy procedures and the care of patients undergoing CE, evidenced by completion of workplace based assessments (WPBAs) recorded in their training portfolio, or reflection in a personal development plan

Note: while certification at upper gastrointestinal endoscopy may increase capsule interpretation ability, it is a desirable, rather than mandatory, eligibility criteria for CE training.

Certification criteria

In order to achieve capsule endoscopy certification, all of the following criteria must be met. Meeting the criteria will be evidenced via the JAG endoscopy training system – www.jets.nhs.uk.

Certification Standard	Evidence required
Evidence of core knowledge	<p>Workplace based assessments or a reflective practice portfolio demonstrating an understanding of the procedure.</p> <p>Attendance at local or regional teaching on luminal gastroenterology, small bowel pathology and the role of capsule endoscopy</p> <p>To meet this requirement an appropriate, recent example should be uploaded. This could be supervisor report, a record of attendance at local teaching or reflection / WBPA from portfolio</p>
Course requirement – attend basic skills in capsule endoscopy course#	<p>Course attendance certificate (JAG approved course) covering</p> <ul style="list-style-type: none"> • indications, risks, alternatives, patient assessment/ selection • procedure • software • normal small bowel and common pathology • patency capsules
Knowledge based competency - complete e-Learning modules	Certificates of completion of JAG approved e-Learning modules
Capsule knowledge-based assessment**	Pass
Procedural competency*	Lifetime minimum number of 50 cases
Procedural skills assessment	<p>A minimum number of DOPS recorded in the JETS eportfolio: 5 CE DOPS 5 C-RX DOPS</p> <p>The most recent 2 DOPS of each type should be scoring 90% competent for independent practice.</p> <p>We strongly recommend that a minimum of:</p> <ul style="list-style-type: none"> - 1 formative CE-DOPS (see appendix 4) is recorded for at least every 10 cases, including equipment use, performing procedure, patency scans, endoscopic placement§ - 1 C-RX DOPS every 10 cases to cover reading and reporting <p>Double reading of videos with feedback via C-RX DOPS</p>

Once the above criteria has been met, the candidate will be required to undergo summative sign off

Completion of summative DOPS	<p>4 summative DOPS completed scoring 'Competent for independent practice' for all items</p> <p>2 CE DOPS 2 C-RX DOPS</p>
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Notes on certification table

*Unlike other endoscopic procedures there are no KPIs for CE. An alternative method of assessing competence at capsule reading is required. An integral part of competence at CE is not only identifying the relevant findings but accurately interpreting their significance and producing an accurate report with relevant recommendations for the referrer.

Assessment would involve double reading of videos with feedback from trainer to trainee on accuracy of reading and report via C-RX DOPs. In a similar manner to endoscopy training, the trainee would need to read a certain number of studies and score adequately on a defined number of DOPS before going on to do a “summative” DOPS. During training the aim would be for the trainee and trainer agreement regarding the significance of findings to be same in 90% of cases (within 1 level of significance grading).

Training course to follow JAG standards –aligned with European training course format and content (10)

**BSG small bowel and nutrition committee endorsed setting up of exam board under auspices of BSG/JAG. Exam will be images and “single best answer” scenario-based questions on identification, reporting significance of finding and immediate management, indications and procedural risks.

§ endoscopic placement is **not mandatory** when it is outside of an individual's usual scope of practice

Training pathway

Overview

The concept of a training pathway is used to define essential and recommended training elements and to provide an overview of progress through the training programme. The key facets of the pathway are highlighted below:

- The identification of each training element allows systematic review and evaluation of its contribution to the overall effectiveness of training.
- The context of training for an individual trainee will vary. There may be wide variation between individuals in when training way-points are reached.
- Standardisation of training pathways allows a closer understanding of the factors affecting the learning curves of trainees within a pathway.
- The training pathway for capsule endoscopy recognises that there are separate elements required to undertaking a capsule endoscopy. This may involve performing a patency procedure, endoscopic placement of the capsule and reading and writing a report. Each of these skills is complementary and to provide a full service the practitioner will require to have mastered each however upper gastrointestinal endoscopy certification is proposed as a desirable, not essential, capability.
- It is proposed that this more intensive (and 'hands on') training will take place over a year.

Core curriculum for capsule endoscopy training

JAG Certification Standards have been developed on the principle that outcomes of training should be linked not only to mastery of the technical skills but to important cognitive aspects of the procedure.

The development of a Core Curriculum for capsule endoscopy provides information to trainees and trainers about areas of practice which are considered essential to the understanding of the indications for the test, risks, benefits, patient specific factors and alternative approaches. Sound basic knowledge is essential for providing informed consent, supporting clinical decision making, accurate reporting and definition of appropriate aftercare. For capsule endoscopy there are several distinct aspects of performing the procedure that make it unique – setting up and performing the procedure, prior use of the patency system, reading and reporting and endoscopic placement as indicated. Each of these aspects needs to be included in the curriculum and assessed by the training pathway.

Testing of knowledge competences aims to ensure coverage of the core topics according to a systematic assessment blueprint. Competency will be defined by the achievement of a threshold mark in the Capsule knowledge-based assessment. Application of knowledge will be assessed by local trainers during training. The Core Syllabus is presented in Appendix 3.

Recommendations to trainers and training programme directors (TPDs)

JAG certification standards for capsule endoscopy should be supported by local and national training infrastructure. Local (in unit): A training unit should meet the following requirements:

- have a minimum of 2 consultant gastroenterologists reporting capsule endoscopy supported where possible by other staff (e.g. nurses, GI physiologists)

- able to pre-read procedures;
- have at least one endoscopist with the skills to endoscopically advance and place capsules;
- have at least 1 nurse or other healthcare professional experienced in performing patency and capsule endoscopy procedures;
- be performing a minimum of 100 small bowel capsule examinations per year;
- either on site device assisted enteroscopy (DAE) or have close links to such a unit with established referral pathways;
- appropriate access to
 - capsule endoscopy reporting systems
 - JETS training portfolio
 - Capsule endoscopy DOPS
- The training delivered in the training unit should include didactic tutoring on small bowel anatomy and pathology, indications, risks, alternatives, patient assessment/ selection with hands-on training with a capsule endoscopy expert to provide double reading with formalised feedback.

Where an individual training unit does not meet these requirements it is acceptable for a 'virtual training unit' to be created where 2 neighboring units collaborate. It is essential that Key Performance Indicators in each unit are met.

Trainers should have sufficient CE and training experience to deliver training evidenced by

- Lifetime experience of >200 procedures
- Active capsule reader
- Completed educational appraisal
- Evidence of ongoing CPD in VCE
- Evidence of maintaining training competence (observing on VCE course, Faculty on a VCE course)
- Experience of DOPS based feedback to trainees.

Those training on training courses should also demonstrate

- Experience of several modalities (Upper GI, Colon, Crohn's capsule) and systems
- Feedback about trainer role on JETs

National resources:

- Specific capsule endoscopy DOPS forms - these are available in electronic format as part of the JETS e-Portfolio and cover the key procedural skills required to perform a capsule endoscopy including patency capsule and endoscopic placement. Specific DOPS forms for reporting are also available (C-RX)
- JAG certification of Capsule Endoscopy courses
- Delivery of a single best answer-based knowledge assessment

Evidence for certification criteria

Summary of evidence to support recommendations for certification and training pathways

Where possible high quality evidence should form the basis of recommendations on training pathways. The quality of evidence supporting individual recommendations should be explicit.

Numbers of procedures required to achieve competence in CE

- Limited evidence suggests that a minimum of 20 procedures is required in order to gain the skills required for CE (5, 10-13), partially dependent on the training background of the individual (2) (LOW QUALITY EVIDENCE)

Use of, and number of, DOPS

- Previous studies have validated summative DOPS assessment using JAG approved DOPS tools as a measure of basic endoscopic procedural competence (17,18) (LOW QUALITY EVIDENCE)

Training courses

- Participation in formal training course increases competence (VERY LOW QUALITY OF EVIDENCE). (11,12,15,16)

Value of 'hands on' SBCE courses

In contrast with other endoscopic procedures, capsule endoscopy relies on visual interpretation of images alone, rather than intubation and manipulation of an endoscope. In the absence of target landmarks, it is difficult to identify key performance indicators (KPIs) analogous to caecal intubation rate used for colonoscopy and duodenal intubation used for upper gastrointestinal endoscopy.

SBCE reading and reporting is time consuming and there are very few studies that address training requirements. From the current literature it is recognised that endoscopy naïve medical students perform less well than gastroenterology trainees (2) and there is variability in learning curves between trainees. It has also been suggested that a hands-on training approach is efficacious in SBCE training (3). The positive effect of hands on courses has been demonstrated in data collected from several European courses (4): a significant improvement was seen in the ability of delegates to classify the type and relevance of small bowel findings following completion of a one-day beginner course. However ideal methods for training in SBCE and objective measures of assessing competence for reading and reporting are yet to be defined. While evidence supports pre- training experience of upper gastro-intestinal endoscopy, appropriate competency can be achieved in the absence of this (11).

Assessment of competence

To assess competence of Gastrointestinal fellows in SBCE reporting, the Mayo Clinic (5)

produced a formalised assessment tool known as the capsule competency test (CapCT). This tests trainees' knowledge of SBCE such as indications, contraindications and possible complications, as well as the ability to accurately identify, interpret and document CE findings. The CapCT assessment comprises 3 sections and trainees must achieve a score of >90% to pass:

1. Multiple choice questions
2. Quiz on 8 cases using video clips and still images
3. Review of a full capsule endoscopy case with complete procedural reporting to include identification of appropriate landmarks, description of findings, timing and presumed location of findings and integration of findings into a patient management plan.

Prior to the CapCT, trainees undergo 4 hours of didactic tutoring and hands on experience with a CE expert followed by supervised reads. They can attempt the CapCT assessment once they have read 5 SBCEs, however published findings support a minimum number of 20 procedures prior to taking the assessment: analysis of CapCT scores showed no significant difference in CapCT scores between experts and fellows that had read more than 20 capsules (5).

Numbers of procedures

Early published recommendations for training by the American Society for Gastrointestinal Endoscopy (ASGE) include a hands-on training course, independence in other endoscopic procedures, didactic tutoring and supervised review of 10 cases following completion of 24 months of GI fellowship (6). This threshold number has since been increased, within the ASGE Small Bowel Core Curriculum to a minimum of 20 studies based on the Mayo findings (5,7).

In general, there is a move towards competency assessment being based on proficiency rather than numbers performed and for SBCE reporting there is no obvious number cut off. Given however the paucity of data, especially in non-endoscopists undergoing training in capsule endoscopy, it is recommended that 50 procedures are undertaken prior to an assessment of competence, regardless of previous endoscopy experience.

Recommended areas for research and development in capsule training

There is, as discussed above, a paucity of evidence to support the design of a training pathway in SBCE. This limits the authors' ability to support their recommendations with an evidence base. We suggest that the following areas would be valuable to study once the training pathway is established:

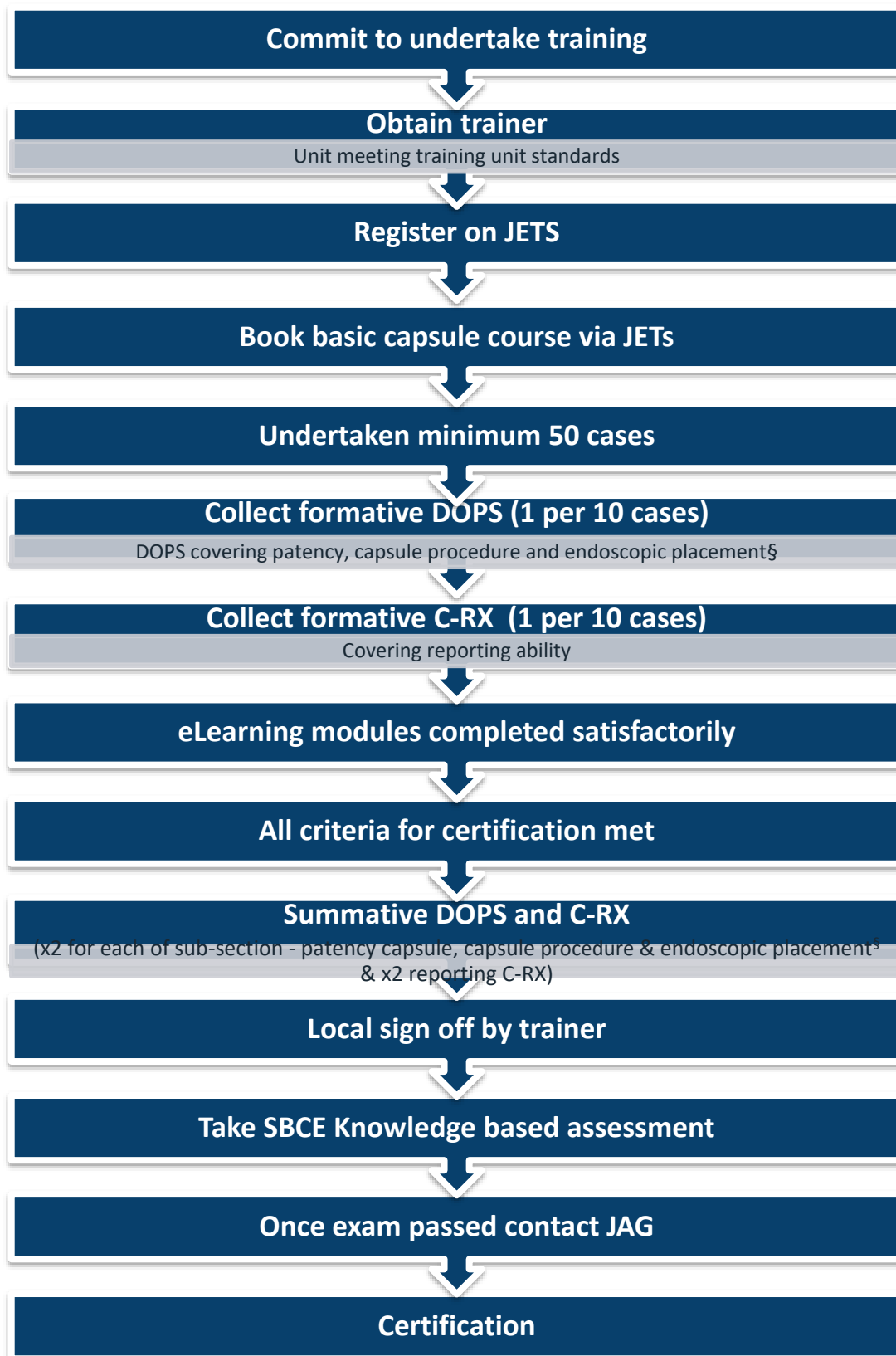
Numbers of procedures required for competency: The performance of learners, based on formative and summative CE-DOPS and C-Rx DOPS, may provide further evidence as to indicative numbers required to achieve competence or the point at which summative assessment should be considered.

Appendices

Appendix 1 – Table of training elements

Training element	Main purpose	Evidence
e-Learning	Introduces to trainee to standardized images of relevant pathology mapped to curriculum including normal, inflammation, tumours, bleeding	Demonstrates access and completion of modules
Capsule course	Provides hands on case based discussions to underpin knowledge and skills along with didactic lectures	Course attendance
Local training	Local training includes supervision of patency capsule, endoscopic placement and reading and reporting and completion of DOPS and C-RX	Local JETS appraisal DOPS and C-RX

Appendix 2 - Capsule endoscopy training and certification pathway



Appendix 3 - Capsule curriculum

The aim of the curriculum is to provide a syllabus and skills learning programme to ensure the acquisition of sufficient knowledge and skill to enable a gastroenterologist to provide a capsule service in a specialist capacity. It will equip trainees to be able to carry out this procedure and read studies to agreed standards of competence, as well as provide a detailed report and recommended actions following the procedure.

Knowledge	Assessment methods	Blueprint %
Knows		
Detailed anatomy of the small bowel	KBA	5
Pathology of the small bowel	KBA, CbD	10
Indications and absolute and relative contraindications for capsule endoscopy and the alternatives	KBA, CbD	5
Requirement for patient preparation including: <ul style="list-style-type: none"> ▪ Consent issues ▪ Bowel preparation, prokinetics and anti-foaming Agent ▪ Management of co-morbidity 	KBA, CbD	5
The risks and complications of capsule endoscopy and their management as well as strategies for their avoidance including: <ul style="list-style-type: none"> ▪ risk of capsule retention and use of patency capsule ▪ capsule aspiration ▪ impaired capsule transport (including use of endoscopic capsule placement) 		25
Skills		
Demonstrates skill in: <ul style="list-style-type: none"> • Assessing the appropriateness and timing of patients for capsule endoscopy • Performing a video capsule procedure • Performing a patency procedure • Accurate interpretation of images on the real time viewer • Endoscopic capsule placement including use of the AdvanCE device 	CbD, DOPS	0
Behaviours		
• Can discuss, explain and gain consent for patients undergoing capsule endoscopy	DOPS, CbD, MSF	0
• Can explain the required aftercare for patients undergoing capsule endoscopy	DOPS, CbD, MSF	0
• Fully participates in the multidisciplinary team, and work effectively within the team to provide safe and high quality care	MSF	

Knowledge	Assessment Methods	%
Outlines the structure and function of capsule endoscope and patency capsule.	KBA, DOPS	2
Skills		
Demonstrates ability to check of function of equipment, correctly place sensor array, deploy data recorder, dispense capsule, use real time viewer and download video. Demonstrates understanding of the hardware system and ability to use the software functions which are necessary for the capsule endoscopy procedure	DOPS, MSF	0
Behaviours		
Shows willingness to learn capsule endoscopy	DOPS, MSF	0
Knowledge	Assessment Methods	%
Understand automatic diagnostic functions and their limitations	KBA, DOPS	4
Understand and apply methods of capsule endoscopy reading and image analysis.	KBA, DOPS	4
Recognise and manage factors (environmental, technical and clinical) that may influence reading accuracy	KBA	3
Understand how to optimise service efficiency by integrating pre-reading into workflow processes		13
Skills		
Demonstrates skill in:		
Competent use of capsule endoscopy software	DOPS, KBA	*
Identifying landmarks and variants of normal anatomy.	DOPS, KBA	5
Recognising normal gastrointestinal mucosal appearance	DOPS, KBA	5
Accurately detecting abnormal and clinically relevant images, including creating descriptive thumbnails.	DOPS, KBA	35
Provide a complete and precise documentation of all findings including localization and clinical relevance in a standardized manner	DOPS, KBA	*
Provide recommendations based on the given clinical information and capsule findings to further direct patient management	DOPS, KBA	15
		60
Behaviours		
Fully participates in the multidisciplinary team, and work effectively within the team to provide safe and high quality care	DOPS, MSF	0

Abnormal pathology blueprint

Code	Diagnostic group
D1	Vascular lesions and bleeding
D2	Lymphatic lesions
D3	Inflammatory conditions including Crohn's Disease
D4	Coeliac disease and its complications
D5	Polyps
D6	Tumours including neuro-endocrine tumours
D7	Infections including parasites
D8	Drug related

Appendix 4 - SB VCE DOPS for Patency capsule

Patency					
Patency Pre Procedure					
Supervision required	Maximum Supervisor undertakes the majority of the case or task & delivers constant verbal prompts	Significant Trainee undertakes case/task with frequent supervisor input and verbal prompts	Minimal Trainee undertakes the case/task with very occasional supervisor input and verbal prompts	Independent Trainee fully competent and would have been able to complete the case/task without the supervisor present	N/A
CONSENT					
INDICATION AND RISK					
PREPARATION					
EQUIPMENT CHECK					
Patency Pre Procedure overall					

Patency procedure					
Supervision required	Maximum Supervisor undertakes the majority of the case or task & delivers constant verbal prompts	Significant Trainee undertakes case/task with frequent supervisor input and verbal prompts	Minimal Trainee undertakes the case/task with very occasional supervisor input and verbal prompts	Independent Trainee fully competent and would have been able to complete the case/task without the supervisor present	N/A
SUPERVISED PATENCY INGESTION					

PATENCY LOCALISATION					
Patency procedure overall					

Post procedure					
Supervision required	Maximum Supervisor undertakes the majority of the case or task & delivers constant verbal prompts	Significant Trainee undertakes case/task with frequent supervisor input and verbal prompts	Minimal Trainee undertakes the case/task with very occasional supervisor input and verbal prompts	Independent Trainee fully competent and would have been able to complete the case/task without the supervisor present	N/A
MANAGEMENT PLAN					
Post procedure overall					
ENTS (endoscopic non-technical skills)					
COMMUNICATION AND TEAMWORK					
SITUATION AWARENESS					
LEADERSHIP					
JUDGEMENT AND DECISION MAKING					
ENTS Overall					
Comments					

SB CE DOPS Capsule procedure and endoscopic placement

Capsule					
Pre Procedure					
Supervision required	Maximum Supervisor undertakes the majority of the case or task & delivers constant verbal prompts	Significant Trainee undertakes case/task with frequent supervisor input and verbal prompts	Minimal Trainee undertakes the case/task with very occasional supervisor input and verbal prompts	Independent Trainee fully competent and would have been able to complete the case/task without the supervisor present	N/A
CONSENT					
INDICATION AND RISK					
PREPARATION - PATIENT					
PREPARATION - GENERAL					
EQUIPMENT CHECK					
Pre Procedure overall					

Capsule procedure					
Supervision required	Maximum Supervisor undertakes the majority of the case or task & delivers constant verbal prompts	Significant Trainee undertakes case/task with frequent supervisor input and verbal prompts	Minimal Trainee undertakes the case/task with very occasional supervisor input and verbal prompts	Independent Trainee fully competent and would have been able to complete the case/task without the supervisor present	N/A
PATIENT CHECK IN AND INITIALISATION					
PATIENT SET UP					
CAPSULE INGESTION					

CAPSULE PROGRESS					
PROCEDURE COMPLETION AND PATIENT DISCHARGE					
VIDEO DOWNLOAD					
Capsule procedure overall					

Endoscopic capsule placement§					
Supervision required	Maximum Supervisor undertakes the majority of the case or task & delivers constant verbal prompts	Significant Trainee undertakes case/task with frequent supervisor input and verbal prompts	Minimal Trainee undertakes the case/task with very occasional supervisor input and verbal prompts	Independent Trainee fully competent and would have been able to complete the case/task without the supervisor present	N/A
RECOGNISES ANATOMY					
PROCEDURE					
COMPLICATIONS					
Endoscopic capsule placement overall					
ENTS (endoscopic non-technical skills)					
COMMUNICATION AND TEAMWORK					

SITUATION AWARENESS					
LEADERSHIP					
JUDGEMENT AND DECISION MAKING					
ENTS Overall					
Comments					

§ endoscopic placement is **not mandatory** when it is outside of an individual's usual scope of practice

Capsule reading and reporting C-Rx					
Supervision required	Maximum Supervisor undertakes the majority of the case or task & delivers constant verbal prompts	Significant Trainee undertakes case/task with frequent supervisor input and verbal prompts	Minimal Trainee undertakes the case/task with very occasional supervisor input and verbal prompts	Independent Trainee fully competent and would have been able to complete the case/task without the supervisor present	N/A
LANDMARKS					
NORMAL FINDINGS					
ABNORMAL FINDINGS					
INTERPRETATION					
GENERATION OF REPORT					
RECOMMENDATIONS					
COMMUNICATION					
Capsule reporting overall					

ENTS (endoscopic non-technical skills)					
COMMUNICATION AND TEAMWORK					
SITUATION AWARENESS					
LEADERSHIP					
JUDGEMENT AND DECISION MAKING					
ENTS Overall					
Comments					

DOPS performance indicators – patency procedure

Pre Procedure	
<p>CONSENT</p> <p>Obtains consent with structured approach</p>	<p>Complete and full explanation of the procedure including proportionate risks and consequences without any significant omissions. Avoids the use of jargon. Does not raise any concerns unduly. Encourages questions to be asked by adopting appropriate verbal and non-verbal behaviours and develops adequate rapport with the patient. Respects the patient's own views, concerns and perceptions</p>
<p>INDICATION AND RISK</p> <p>Assessment of indications and any specific risk factors</p>	<p>Full and appropriate assessment of the appropriateness of the procedure and any viable alternatives. Appropriate assessments of peri-endoscopy risks in current patient. Initiates and maintains any appropriate action to minimise any specific risks.</p>
<p>PREPARATION</p> <p>Preparation of room for procedure</p>	<p>Ensures all appropriate pre-procedure checks are performed as per local policies. Ensure procedure is carried out with full respect for privacy and dignity.</p>
<p>EQUIPMENT CHECK</p> <p>Checks patency capsule</p>	<p>Ensures patency capsule functions correctly using the patency scanner</p>

Patency procedure	
<p>PATENCY LOCALISATION</p> <p>Localises patency capsule (patency scan or imaging) at appropriate time</p>	<p>Performs patency scan in appropriate environment at appropriate time after ingestion If patency scanner not being used, or if the scan is positive, then appropriate imaging to localise the capsule is arranged and reviewed.</p>

Post procedure	
<p>MANAGEMENT PLAN</p> <p>Organises capsule endoscopy appropriately</p> <p>Communication of results and plan with patient</p>	<p>Organises capsule endoscopy within appropriate timescale if scan negative or imaging confirms location beyond small bowel. Cancel video capsule if scan positive and patency located to small bowel</p> <p>Clear communication of results and management plan with patient and/or carers.</p>

DOPS performance indicators – capsule endoscopy procedure

Pre Procedure	
<p>CONSENT</p> <p>Obtains consent with structured approach</p>	<p>Complete and full explanation of the procedure including proportionate risks and consequences without any significant omissions. Avoids the use of jargon. Does not raise any concerns unduly. Encourages questions to be asked by adopting appropriate verbal and non-verbal behaviours and develops adequate rapport with the patient. Respects the patient's own views, concerns and perceptions</p>
<p>INDICATION AND RISK</p> <p>Assessment of indications and any specific risk factors</p>	<p>Full and appropriate assessment of the appropriateness of the procedure and any viable alternatives. Appropriate assessments of peri-endoscopy risks in current patient. Initiates and maintains any appropriate action to minimise any specific risks.</p> <p>Considers if patency capsule necessary or reviews result of patency capsule before performing study.</p>
<p>PREPARATION – PATIENT</p> <p>Preparation of patient to optimize study quality and ensure patient safety</p>	<p>Ensures special needs are identified and competently managed, including those associated with co-morbidity. Ensures correct medicine management and appropriate use of bowel preparations, prokinetics and antifoaming agents to prepare the small bowel.</p>
<p>PREPARATION - GENERAL</p> <p>Preparation of room for procedure and communication with assisting staff</p>	<p>Ensures all appropriate pre-procedure checks are performed as per local policies. Ensures that all assisting staff are fully apprised of the current case and that all equipment and / or medications likely to be required for this case are available. Ensure procedure is carried out with full respect for privacy and dignity. Maintains clear communication with assisting staff throughout peri-procedure period.</p>
<p>EQUIPMENT CHECK</p> <p>Checks data recorder, capsule and accessories</p>	<p>Ensures previous data is downloaded, data recorder battery is fully charged and checks capsule expiry date. Ensures availability of sensor array/belt and selects appropriate option.</p>

Capsule procedure	
<p>PATIENT CHECK- IN AND INITIALISATION</p> <p>Correct completion of check in process</p>	<p>Ensures correct input of capsule and patient data into software template, initialization of capsule appropriately</p>
<p>PATIENT SET UP</p> <p>Correct attachment of sensor leads or sensor belt</p> <p>Correct use and attachment of data recorder</p>	<p>Correctly positions sensor leads or belt.</p> <p>Correctly attaches data recorder, confirms correct patient, and ensures data received</p>
<p>CAPSULE INGESTION</p> <p>Supervised swallowing of capsule</p>	<p>Ensures capsule swallowed with antifoaming agent in safe manner with appropriate resuscitation equipment available</p> <p>Clear communication of instructions to patient, including eating/drinking</p>
<p>CAPSULE PROGRESS</p> <p>Use of real time viewer to correctly verify small bowel entry</p> <p>Adopts strategies to promote progress of capsule if gastric transit delayed</p>	<p>Correctly uses the real time viewer to ensure capsule advancement into duodenum and arranges endoscopic advancement if positional and pharmacological measures unsuccessful</p>
<p>PROCEDURE COMPLETION AND PATIENT DISCHARGE</p> <p>Disconnection of equipment</p> <p>Communication of discharge instructions</p>	<p>Correctly disconnects sensors and date recorder.</p> <p>Provides patient with appropriate and accurate discharge information</p>

VIDEO DOWNLOAD Download of capsule data	Correctly downloads video from recorder to PC. Ensures download completion and manages download failure correctly.

Performance Indicators - Endoscopic Capsule Placement[§]

RECOGNISES ANATOMY Recognises and notes the position of the gastro-oesophageal junction, and is appropriately orientated within the stomach and duodenum	Ensures that the capsule is advanced into the duodenum
PROCEDURE Uses AdvanCE device (or alternative device eg. Roth net) appropriately and safely Completes procedure in reasonable time High quality images recorded	Ensures equipment functioning correctly and staff aware of use Completes whole procedure in reasonable and appropriate time, without rushing and without unduly prolonging the procedure. Ensures endoscopic image of successful placement obtained
COMPLICATIONS Recognises and manages complications appropriately	Rapid recognition of complications from the endoscopy or endoscopic procedures or those arising in the peri-endoscopy period. Manages any complications appropriately and safely.

§ endoscopic placement is **not mandatory** when it is outside of an individual's usual scope of practice

Performance Indicators – Capsule Reading and Reporting

Capsule reading and reporting	
LANDMARKS Recognition and marking of normal landmarks	Accurately identifies normal anatomical landmarks – first gastric image, first duodenal image, first caecal image Accurately records thumbnails of normal anatomical landmarks – first gastric image, first duodenal image, first caecal image
NORMAL FINDINGS Appropriate marking of findings with thumbnails Identification of normal findings/ variants	Accurately records normal variants and assigns correct significance
ABNORMAL FINDINGS Recognition and documentation of abnormal findings as thumbnails	Abnormal findings recorded correctly and level of significance ascribed – Definitely significant Probably significant Possibly significant Unlikely significant Not significant
INTERPRETATION Adequate interpretation of significance of any findings	Significance of findings correlates with that ascribed by trainer. Independence would be achieved if the level of significance was no more than one level different to trainer.

<p>GENERATION OF REPORT</p> <p>Quality of report</p>	<p>Includes documentation of patient demographics, indication, previous investigations, whether patency performed, preparation used, quality of views, reference to capsule excretion.</p> <p>Findings clearly described utilising agreed terminology eg CEST¹⁹ and Lewis score for IBD. Report signed (manually or electronically) by reporter.</p>
<p>RECOMMENDATIONS</p> <p>Quality of recommendations for further patient management</p>	<p>Develops and completes an appropriate management plan for post capsule care including, where indicated, drug or other therapies, further investigations, responsibility for follow up or further actions.</p>
<p>COMMUNICATION</p> <p>Communication of results and plan to referrer</p>	<p>Clear report communicated to referrer within reasonable timeframe</p>

ENTS (endoscopic non-technical skills) – for all assessments

<p>COMMUNICATION AND TEAMWORK</p>	<p>Gives and receives knowledge and information in a clear and timely fashion.</p> <p>Ensures that the team are working together from the same information and understand the 'big picture' of the case.</p> <p>Ensures that the patient is at the centre of the procedure, emphasising safety, comfort and giving information in a clear and understandable fashion</p>
<p>SITUATION AWARENESS</p>	<p>Maintains continuous evaluation of the patient's condition.</p> <p>Ensures lack of distractions and maintains concentration, particularly during difficult situations.</p>
<p>LEADERSHIP</p>	<p>Provides emotional and cognitive support to team members by tailoring leadership and teaching style appropriately.</p> <p>Supports safety and quality by adhering to current protocols and codes of clinical practice.</p> <p>Adopts a calm and controlled demeanour when under pressure. Utilising all resources to maintain control of the situation and taking responsibility for patient outcome.</p>
<p>JUDGEMENT AND DECISION MAKING</p>	<p>Considers options and possible courses of action to solve an issue or problem, including assessment of risk and benefit.</p> <p>Chooses a solution to a problem, communicates this to team members and implements it</p> <p>Reviews outcomes of procedure or options for dealing with problems. Reflects on issues and institutes changes to improve practice</p>

Appendix 5 – Capsule endoscopy training courses

Courses will be JAG approved and delivered via the JETs platform. A course code has been assigned (Course code: JAG_GDM2 Course name: Capsule endoscopy - beginners and advanced) to allow Training centres to deliver courses to agreed Learning Objectives.

Faculty

The Faculty of a course will work in a unit delivering >100 SBCE per year, have previously attended a TTT course and have observed an established course before becoming a Course director. Courses will focus on the delivery of training on one capsule system platform e.g. PillCam®, OMOM®, CapsoCAM®, MicroCam®, although some centres may deliver courses on several platforms at different times.

Learning objectives

Learning outcome	Content	Trainee group
Technology Knowledge and competent handling of the video capsule system, software functionality and accessories	Technical specifications, performance characteristics of system components: Video capsules Sensor array/wearable antennas Data recorder, real time viewing Workstation, software, network application Patency capsule and scanner	1. VC endoscopist 2. Nursing staff performing the procedure
Assessment and consent Appropriately assess, select and consent patients for procedure, identify risk, recognise and manage special needs	Indications, fields of application, alternatives Absolute and relative contraindications Capsule retention, risk reduction strategies Special needs requiring modification of the procedure including the critically ill, swallowing disorder, impaired motility Endoscopic placement Consent issues	1. VC endoscopist
Procedure Understand requirements for preparation and perform procedure (video capsule and patency)	Patient preparation: Dietary / fasting, bowel purgatives, prokinetics, anti-foaming agent Management of co-morbidity Video capsule procedure, video download Patency capsule procedure Complications Patient discharge	1. VC endoscopist 2. Nursing staff performing the procedure
(Pre) Reading Navigate software to read videos, recognise a normal study, detect and save	Software functionality Practical methods of reading and image analysis Anatomical landmarks, variants of normal	1. VC endoscopist 2. Reader extender

Reporting and Diagnosis Accurately document findings including clinical relevance with integration of findings into management plans. Including Interpretation of abnormal findings, Report components VCE standard terminology, Integration of VCE findings in deriving an endoscopic diagnosis and Recommendation to direct patient management

Assessment of learning

Each course will begin with an assessment of the participants’ knowledge and this will be repeated at the end of the course to demonstrate value. 10 videos will be used in this process.

Pre course evaluation

Profession: Doctor Nurse Other

Capsule endoscopies previously read:

0 1-10 11-25 26-50 51-100 >100

Gastroscopies previously performed:

0 1-100 101-500 501-1000 >1000

Colonoscopies previously performed:

0 1-100 101-500 501-1000 >1000

Video	Is the lesion significant?	Diagnosis or finding
1	Yes/No	
2	Yes/No	
3	Yes/No	
4	Yes/No	
5	Yes/No	
6	Yes/No	
7	Yes/No	
8	Yes/No	
9	Yes/No	
10	Yes/No	

Post course evaluation

Video	Is the lesion significant?	Diagnosis or finding
1	Yes/No	
2	Yes/No	
3	Yes/No	
4	Yes/No	
5	Yes/No	
6	Yes/No	
7	Yes/No	
8	Yes/No	
9	Yes/No	
10	Yes/No	

Feedback/ course evaluation

Each course will seek feedback from participants to allow changes to the format to be made as required. This will mirror the JAG process for other courses.

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