Joint Advisory Group for GI Endoscopy (JAG)
Improving Safety and Reducing Error in Endoscopy (ISREE)
Implementation strategy

Abstract

This document introduces the JAG strategy for Improving Safety and Reducing Error in Endoscopy (ISREE). It is written primarily for project contributors and the JAG working groups as a strategy document but is also available for all JAG service users for reference to inform them of evolving practice. It is the intention that over the next three years there will be an iterative process to incorporate the developments summarised as actions in this document into training and clinical service. Endoscopy services will be informed of any changes required, for example in the GRS, accreditation process or certification criteria, as appropriate. The proposed actions with timescales are listed on page 6.

Author: Siwan Thomas-Gibson, Chair JAG

Co-authors:

John Green: Chair Endoscopy Services Quality Assurance Group (ESQAG)
Geoff Smith: Chair Quality Assurance Training (QAT)
Manmeet Matharoo: Trainee representative
Keith Siau: JAG clinical fellow / trainee
James East: Chair JAG research committee
George Webster: Vice President BSG (Endoscopy)
Neil Hawkes: JAG Quality Assurance of Training working group
Catherine Patterson: Patient representative
Nick Sevdalis: Professor of Implementation Science & Patient Safety
Bryn Baxendale: Royal College Anaesthetists
Tim Shaw: JAG programme manager
Raphael Broughton: JAG senior programme manager

A full list of delegates at the ISREE workshop is available in appendix A.

Contents

Introduction

Medical error has been cited as the third leading cause of all deaths in the US (Makary and Daniel 2016). Although the methods of estimating deaths attributable to clinical errors are debated (Shojania and Dixon-Woods 2016), there is no doubt that clinical errors do happen and some of them do lead to significant patient harm, physical or psychological, or disability.

Rather than 'error' however we should consider adopting the term 'patient safety incident' as most 'errors' are not formally reported as such. Reporting 'patient care hazards' could form an important vehicle for learning if we encourage shared discussion at a local level and some form of wider data collection and analysis at a national level. In some instances, deviation from rules, guidelines, and best practices may have been bypassed to serve specific circumstances, making sense to an individual clinician or team. Reporting of these deviations should be encouraged and discussed without fear of recrimination as they may represent examples of a system's resilience.

Patient safety incidents occur in every medical field and most are without significant consequence (Vincent 2001) however every event is an opportunity to prevent more significant harm from occurring but only if there is an understanding of how the event occurred and if strategies are put in place to strengthen practices to mitigate against progression to cause harm.

In the UK, the 2004 NCEPOD report 'Scoping our Practice', estimated a 3% 30 day mortality rate following therapeutic endoscopic procedures (Cullinane 2004)**.** There is no recent evidence available to suggest this has changed (Kalaitzakis 2016).

There is wide variation in sedation practice in the UK, with anaesthetic involvement for complex endoscopy (eg ERCP) ranging between < 5% and 100% of cases. Inadequate sedation may be associated with procedure failure and patient distress, 10% of patients experience acute psychological trauma after sedated ERCP (Jeurnink 2012) and over sedation may lead to serious adverse outcomes. Pre-endoscopy sedation and anaesthetic assessment is poorly standardised.

Colonoscopy quality has undoubtedly improved (Bowles 2004; Gavin 2012) and JAG GRS data suggests that this improvement extends beyond colonoscopy through various initiatives.

Training in endoscopy in the UK has also significantly improved in the last 20 years with formalised competency assessments and a centralised electronic certification pathway for all new endoscopists since 2011 (Siau 2017*).*

Endoscopy services still face a number of key challenges however. These include:

1) Increase in demand - total procedure numbers have increased since the NCEPOD report to 1,235,000 OGDs and 911,000 colonoscopies in 2017 (Shenbagaraj 2018)
2) Increase in numbers of patients attending 'straight to test'
3) Increasing age and morbidity of patients (Cancer Research UK, 2015)
4) Increasing complexity of therapeutic endoscopic procedures (Cancer Research UK, 2015)
5) An increasingly mixed discipline workforce with different training needs (Siau, 2017)

JAG already promotes high quality safe endoscopy and has a number of strategies to support endoscopy services to deliver this. The Global Rating Scale (GRS) and JAG accreditation standards have a specific safety domain however safety runs throughout every aspect of the standards:

CQ Clinical Quality	QP Quality of the Patient Experience
CQ1 Leadership and Organisation **CQ2** Safety **CQ3** Comfort **CQ4** Quality **CQ5** Appropriateness **CQ6** Results	**QP1** Respect and Dignity **QP2** Consent Process Including Patient Information **QP3** Patient Environment and Equipment **QP4** Access and Booking **QP5** Planning and Productivity **QP6** Aftercare **QP7** Patient Involvement
WR Workforce	**TR Training**
WR1 Teamwork **WR2** Skill Mix and Recruitment **WR3** Professional Development	**TR1** Environment and Training Opportunity and Resources **TR2** Trainer Allocation Skills **TR3** Assessment and appraisal

Although the GRS has these safety metrics in place, JAG does not routinely scrutinise or collate patient safety incidents related to endoscopy in detail. The GRS annual reviews of accredited services and JAG accreditation visits expect that there are systems in place to collect, analyse, feedback and make changes where necessary, all at a 'local level'. JAG does not ask them to report specific incidents and as a result there is no overarching picture of how safe endoscopy is in the UK and themes/learning messages are not shared across the service.

Thirty-day mortality and eight-day readmission audits are, at best, a crude evaluation of safety and will not pick up all safety incidents. There is no overview of the potential opportunities to share learning from these audits.

Services will report safety incidents and events via their hospital's DATIX (or equivalent) reporting systems however these are notoriously poor for feeding back to the individual unit and there is no effective mechanism to share outcomes between units in different organisations.

JAG adopts the premise that there is an increasing necessity to improve how services report errors, patient safety incidents and near misses and an opportunity to improve safety by sharing learning from such events. This is in line with the modern patient safety literature, reviews of which propose that there are various mechanisms that can be applied to learn from incidents and problems in patient care (de Feijter 2012). Indeed a better understanding of how a near miss or incident was prevented from progressing ('error (event) recovery') may proffer fertile ground for shared learning. 'Learning from excellence' aligns with a systems safety focus and an understanding of organisational (service) resilience alongside the need to develop and improve adaptability in teams to respond to the challenges of complexity in our current system.

Learning from patient safety incidents in endoscopy and training in human factors has not been a core feature of JAG endoscopy training programs to date. Indeed, this area of training has not been widely taught in the medical curriculum. Courses do exist but are optional and small in number – and many of them lack high quality evidence for validity and wider evaluation. To our knowledge only a couple of centres provide any Human Factors training in endoscopy in the UK. Similarly training in incident report analysis is not part of any formal wider-scale medical, surgical or nursing curriculum.

Whereas an assessment of Endoscopic Non-Technical Skills (Matharoo 2014) is now included in all the JAG Direct Observation of Procedural Skills assessment forms (Siau 2018) there has been no associated training in the delivery or assessment of this domain.

Safe sedation is a crucial part of endoscopy and is covered in basic skills courses but this is inadequate according to Royal College Anaesthetists guidelines on Safe Sedation (Royal College of Anaesthetists, 2013). This is particularly relevant in light of the increasing complexity and range of patients and procedures now performed routinely. Of note, in the US, a multisociety sedation curriculum for GI endoscopy has been developed that provides a comprehensive guide to train providers in all aspects of procedural sedation. This is referenced in the ASGE's credentialing guidelines (Vargo 2012).

In light of the above challenges JAG considered it imperative to reflect and review where the future of endoscopy patient safety lies – including how GI endoscopy services can be made safer but also more self-reflective and able to learn from safety incidents, on a national scale.

ISREE workshop

In January 2018 a workshop was convened to discuss a new initiative within JAG: ISREE- Improving Safety and Reducing Error in Endoscopy.

The primary outcome from this workshop was to develop a strategy to address these and other issues identified by the group. The group participants (appendix A) represented the multidisciplinary membership of JAG and included those with relevant responsibility in JAG, skills or interest:

- JAG subgroup responsibility
- Expertise or special interest in the area of patient safety
- Training in human factors and non-technical skills
- Implementation and improvement sciences
- Allied specialties with specific skills (eg anaesthetics)
- Trainee representatives
- Patient representative

The workshop program is shown in appendix B. At the end of the workshop a list of key strategic actions were identified. These were then reviewed further and prioritised at the following JAG strategy meeting in February 2018. Feedback from the members of the workshop was collated and is summarised in appendix C. This document outlines these actions with timelines agreed by consensus and relevant notes.

Action list

Priority
Immediate: within 6 months
Medium term: within 12-24 months
Long term: within 3-5 years

Description	Priority	Responsibility
A: How JAG can improve training in ENTS and incident reporting		
A1. JAG requirements to be updated to include a recommendation for a local safety lead to be identified in each endoscopy service. This may be a clinician who already has this responsibility within the trust/organisation. This individual should report to the medical director or equivalent.	Immediate	ESQAG
A2. JAG training requirements and guidance to recommend the development of simulator training in Endoscopy non technical skills (ENTS), to be delivered to endoscopy teams at a local or regional level. This is likely to be a level A GRS requirement	Immediate	QA-T/ ESQAG
A3. JAG QA-T to review Safe Sedation training and Royal College Anaesthetists guidance on non-anaesthetist delivered sedation 1. Identify a lead for this workstream on QA-T to work with anaesthetic colleagues – Royal College Anaesthetists have approved a formal JAG representative 2. Review current training in sedation in mandated basic skills courses 3. Increase uptake of the e-learning materials on safe sedation	Immediate	1: QA-T 2, 3: QA-T / e-learning WG
A4. JAG QA-T working group to work with the federation of training centres to develop a Pilot Simulator course-on human factors and non-technical skills. Course will include: • measuring outputs • gaining evidence • monitoring outcomes	Medium	QA-T
A5. JAG QA-T with the e-learning group to develop e-learning materials for: • Improving Safety • Learning from Error/patient safety incidents • ENTS training	Medium	QA-T/ e-learning working group

B: How JAG can promote measures to prevent patient safety incidents		
B1. Develop a Communication strategy for promoting a Safety Culture This is a key priority for JAG and a number of overlapping actions will address this. The JAG website will host a 'Lesson of the Month'. Any endoscopy team member will be able to submit an anonymised endoscopy related error (or omission or commission) that has a useful learning point. A small subgroup will review and edit submissions prior to posting on the Website. The aim is that publication of a case will earn CPD and encourage others to engage and reflect more openly on endoscopy errors. The unit safety leads could be sent these and have responsibility for cascading to their endoscopy team.	Immediate	QA-T
B2. JAG to develop mechanism to allow endoscopists to track and evaluate engagement with safety lessons to look at potential for those reading the published cases will earn CPD.	Medium	QA-T
B3. Link with other professional societies (eg Radiology) to understand how they utilise educational tools (for example the READ journal)	Immediate	QA-T
B4. Recommendation for clear lines of responsibility for patients requiring deep sedation or an anaesthetic; JAG requirements to be updated to include a recommendation for a named anaesthetic lead for endoscopy (OOH, emergency, therapy, safe sedation, pre-assessment). QA-T to strengthen links with Royal College Anaesthetists and to link with the GPAS/ACSA work being undertaken at RCoA (to inform standards of best practice within anaesthetic departments).	Immediate	ESQAG/BSG
B5. JAG requirements to be updated to include a recommendation for endoscopy specific pre-assessment service review. This will be a requirement in order to be accredited.	Immediate	ESQAG
B6. Explore use of apps and digital technology to facilitate online pre-assessment, appointment reminders, surveillance appointments prompts	Medium	ESQAG
C: How JAG can promote Patient Safety Incident reporting		
C1. JAG ESQAG leads to review JAG requirements for each service to have a forum to discuss 'misses and omissions / error' regularly.	Immediate	ESQAG
C2. JAG to work with Bowel Cancer Screening to share a framework of defining 'Error'	Medium	ESQAG
C3. Optimise use of current IT systems to capture pre and post-procedural errors in addition to intra-procedural errors (for example ability to add addendum to the record) using the NED/ERS interface; use of technology to capture data directly from patients eg via text, email, apps following appointments	Medium	NED/ESQAG
C4. Develop and share a template(s) for optimal 30 day mortality and 8 day readmission audits	Medium	ESQAG
C5. JAG to develop a national working group on Safe Endoscopy with a national safety lead. This group would be multidisciplinary and will include patient representation	Long	ESQAG /JAG exec

C6. Work with the National Reporting & Learning System team on how to optimise efficiency and effectiveness of error reporting, promote no-blame culture and how to improve dissemination of DATIX outcomes within and beyond endoscopy units	Long	NED/ ESQAG
D. How can JAG promote Learning from Incidents		
D1. National and Local Safety Leads in Endoscopy to liaise with NRLS, patient, nursing and trainee groups to establish how best to learn from incidents utilising endoscopy-filtered NRLS data.	Medium	ESQAG/QA-T
D2. JAG representatives to liaise with BSG-EQIP and GiRFT networks re Safety in Endoscopy	Medium	ESQAG/QA-T/JAG chair/NED
D3. JAG aims to develop a relationship with ERS companies to consider how we can optimise the capabilities of ERS/NED in a similar way to radiology systems using their electronic reporting systems (eg PACS) to promote learning from endoscopy events for example • Flag reports which highlight good practice • Share 'lesson of the day' • Share near-misses • Highlight errors and feedback reports easily to endoscopists with an emphasis on learning and no-blame	Long	NED
D4. Optimise use of current JAG required audits to define and categorise errors that commonly occur for example: • To identify safety/error themes from audits and share learning	Long	ESQAG
D5. QA-T to develop methods of reflective practise eg using JETS to reflect on error/near misses and serious incidents Assess feasibility of recording procedures as a tool for feedback and learning from team and ENTS perspective. This could facilitate: • Training • Feedback • 360 degree assessment	Long	QA-T
E How can JAG support underperforming services/endoscopists		
E1. JAG to develop guidance on how to better identify underperformance and develop referral criteria alongside resources for practice improvement : • Identify an intervention suite of options for supporting endoscopists in difficulty • Regional Training Centres to identify trainers willing to act as mentors • JAG to liaise with HEE Professional Support Unit • Identify leadership development resources(eg through Royal College Physicians) • Link with GiRFT	Immediate	QA-T/ ESQAG/ NED

E2. JAG QA-T to develop validation of 360 degree tool (MARS) for use when under-performance is identified	Immediate	QA-T
E3. Review Safety Culture tools to increase philosophy of self-improvement and willingness to engage in safety, error and improvement interventions	Long	QA-T

Plan of work

1. The JAG QA-T and ESQAG have met and discussed their actions (Feb-July 2018).
2. The strategy will be presented to the JAG committee in October 2018
3. Individuals required for various workstreams will be identified as necessary by August 2018
4. An update on the strategy will be discussed at all ESQAG, QAT, JAG strategy and JAG committee meetings.
5. STG plans to submit a project proposal to address some of the key immediate actions via the JAG committee and JAG research committee (September 2018)
6. Working group of key members (Chair: JAG, ESQAG, QA-T, Research and NED) to discuss collaborative work streams and to consider if further ISREE whole workshop needs repeat meeting.

Version control

This document will be reviewed annually from date published and/or updated as required. The version control is shown below.

Version	Date	Description
1.0	1 August 2018	Final version approved by JAG Chair

Appendix A: list of participants in ISREE workshop

Name	Position
Dr Adam Haycock	Consultant gastroenterologist and hon lecturer Imperial. ENTS development; previous chair federation TC'S
Dr Andrew Plumb	JAG Royal College of Radiologists representative; consultant radiologist and senior lecturer, UCH.
Professor Bryn Baxendale	Consultant anaesthetist Nottingham University & honorary professor of psychology; president of the association of simulated practice in healthcare; Member CHFG
Miss Catherine Patterson	JAG patient rep
Ms Debbie Johnston	JAG head assessor
Dr Eleanor Wood	Consultant gastroenterologist; director medical education Homerton
Ms Eva Lynch	JAG assessment manager
Dr George Webster	BSG vice president for endoscopy; consultant gastroenterologist, UCH.
Dr Helen Griffiths	JAG deputy head assessor; consultant nurse endoscopist
Dr Jill Swift	Consultant gastroenterologist, Cardiff
Mr Jim Doherty	Consultant colorectal surgeon Highlands; clinical lead for bowel screening
Ms Jo Simmons	Clinical Human Factors Group programme manager
Dr John Dean	Clinical director of quality improvement and patient safety, RCP. Cons Phys; Dep Med Dir East Lancashire trust
Dr John Green	ESQAG chair; consultant gastroenterologist; senior lecturer, Cardiff
Dr Keith Siau	JAG research fellow; gastroenterology trainee
Dr Manmeet Matharoo	Senior gastroenterology trainee; PHD safe endoscopy
Dr Mark Feeney	JAG international chair; consultant gastroenterologist
Dr Mary Newton	Consultant anaesthetist, Queens Square; Director of National Safe Sedation course
Dr Neil Hawkes	QATWG chair; consultant gastroenterologist
Dr Nick Church	Consultant gastroenterologist Edinburgh; endoscopy lead Lothian
Professor Nick Sevdalis	Professor of implementation science & patient safety at KCH
Dr Paul Dunckley	JETS training lead; consultant gastroenterologist
Dr Phil Berry	Consultant gastroenterologist, GSTT
Dr Priya Narula	JAG rep as consultant paediatric gastroenterologist
Mr Raphael Broughton	Senior programme manager
Dr Rehan Haidry	Consultant gastroenterologist, UCH
Dr Richard Thomson	Consultant gastroenterologist Northumbria; clinical sub-dean, University of Newcastle
Dr Siwan Thomas-Gibson	JAG chair; consultant gastroenterologist; hon senior lecturer Imperial College
Mr Tim Shaw	JAG programme manager
Dr Tom Lee	NED clinical lead; consultant gastroenterologist
Mr Will Garrett	Consultant colorectal surgeon, Maidstone

Appendix B: ISREE workshop agenda

Royal College of Physicians

JAG
Joint Advisory Group on GI Endoscopy

Improving Safety and Reducing Error in Endoscopy (ISREE) - a workshop
Agenda

Location: Pickering Rosenheim room, House 5, Royal College of Physicians, St Andrews Place, London, NW1 4LE

Date: 12 January 2018

Time: 09.30 to 16.45

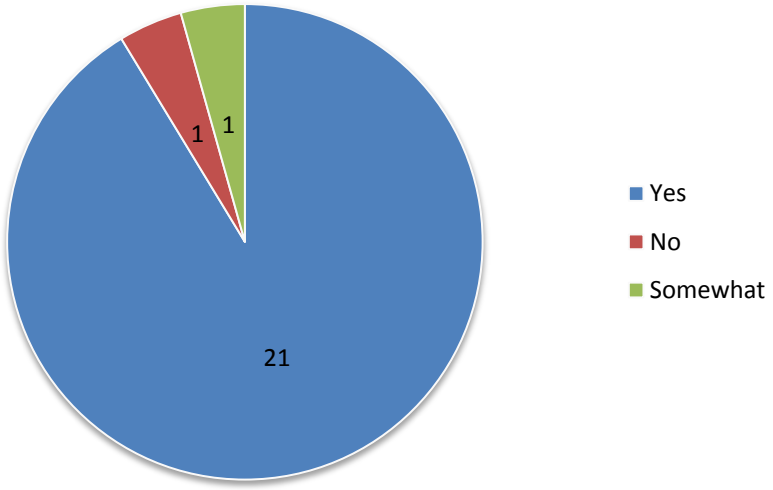
Programme

09:30	**Coffee, registration and meet the team**	
09:55	Introduction, aims and icebreaker	Dr Siwan Thomas-Gibson
What do we know?		
10:20	What does error mean and what is its impact?	Prof Nick Sevdalis
10:40	What would ideal be? Systems approach	Dr John Dean
10:50	What do patients think?	Ms Catherine Patterson (JAG patient rep)
10:55	Addressing patients concerns: Clinical Human Factors Group	Ms Jo Simmons
11:00	Discussion	All
11:15	**Coffee**	
Who does it well?		
11:30	Anaesthetics: how ANTS developed	Prof Bryn Baxendale
11:40	Anaesthetics: safe sedation in endoscopy	Dr Mary Newton
11:50	Radiology: READ it right	Dr Andrew Plumb
12:00	Surgery: CORESS	Mr Jim Docherty
12:10	Discussion	All
What does JAG do already and what are the limitations?		
12:25	JAG/GRS: safety and error measures	Dr John Green
12:35	What are the commonest errors?	Dr Helen Griffiths
12:45	Human factors training	Dr Eleanor Wood
12:55	Can we assess ENTS?	Dr Adam Haycock

11 St Andrews Place, Regent's Park, London NW1 4LE
Tel: +44 (0)20 3075 1649, Fax: +44 (0)20 7487 5218, www.rcplondon.ac.uk
Registered charity no 210508

Appendix C. Improving Safety and Reducing Error in Endoscopy (ISREE) workshop Delegate feedback

1. **Were the objectives of the day made clear to you?**



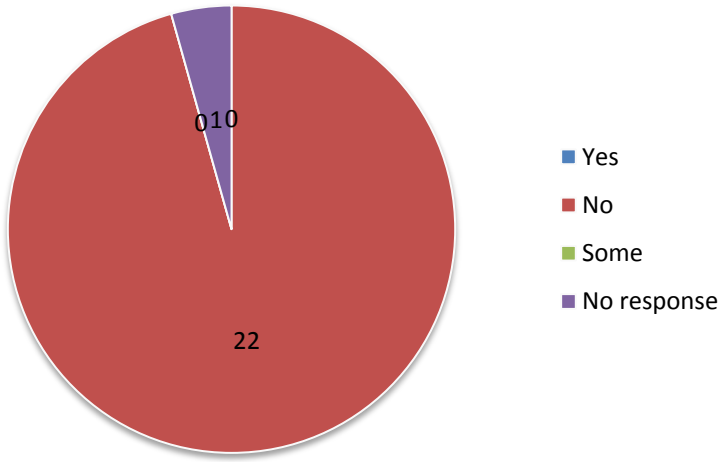
2. **What do you think was most useful about the day?**

1	Bringing together so many expert and specialties
2	Expert interaction
3	Networking
4	Multiple different disciplines
5	This was a particularly helpful and fantastic day, good to see how others approach safety
6	Hearing from experts and afternoon discussion
7	Being with multi-disciplinary key opinion lenders on a good orientated day. Good examples of successful strategies e.g read
8	Lessons from other specialities about anaesthetics
9	Wealth of experience from across service and external perspectives
10	Great to hear on patient experience, broad spectre of expertise
11	Breadth of views and expertise
12	Expertise, passionate and in agreement that this is a priority – exhilarating
14	Galvanising expert experience
15	Joint discussion, national remit
16	Crystallising thinking about the importance of and opportunities presented by error reporting
17	The presence of many different specialities/skill sets
18	Discussion of safety issues
19	Diverse contribution, patient voice
20	Group break and ideas

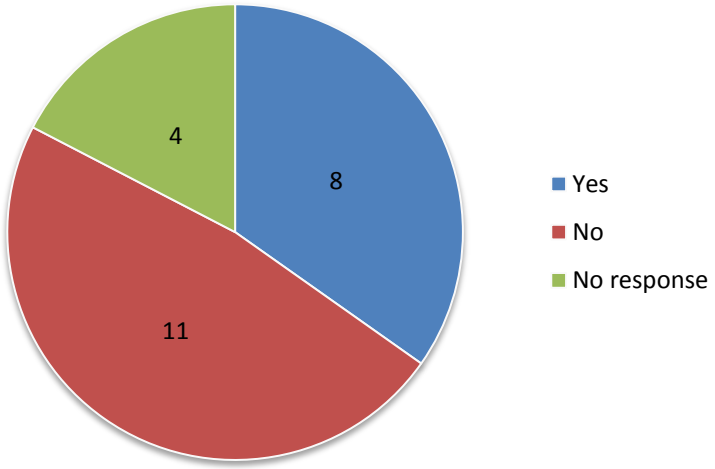
3. What actions do you think you will take as a result of the day?

1	Share learning with my endoscopy department
2	Robust process of sharing and learning form errors, collate learning
3	Reflect on local culture. Keen to be involved further
4	Participate in some course
5	Develop local safety lead
6	Get involved in sedation course in Scotland, get involved in today's action plan
7	I will discuss with leads of the day whether I can support the programme of work
8	Formulating a national working group
9	Develop more JAG resources
10	Explore contribution of NED
11	Work with JAG and consolidate some of the ideas
12	Blue sky thinking – probably difficult given resources issues
13	Look into human factors training for myself
14	Offer on going involvement and to strengthen link with RCOA and wider community
15	Develop sim day, standardise scenarios for training
16	Consider realistic implementation strategies
17	Seek peer review of NTS Homerton course, ensure linkage with ENTS curriculum, consolidate evidence
18	Support the improvements in E work
19	BSG engagement

4. Were there any sessions and/or activities that were unnecessary?

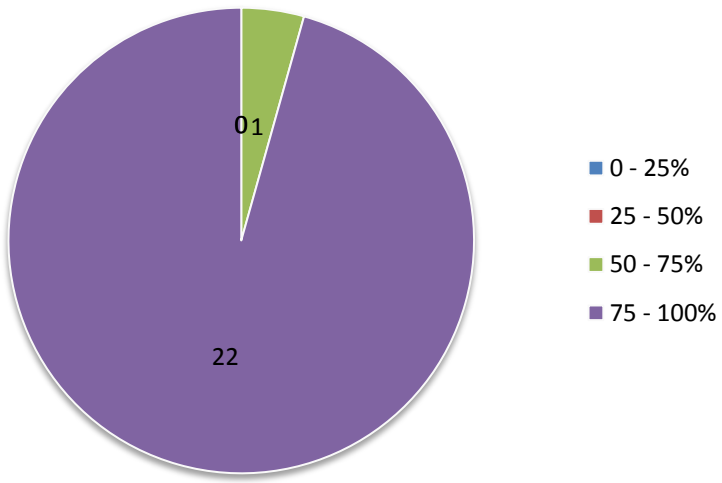


5. Were there any topics that you would suggest should have been included but were omitted?

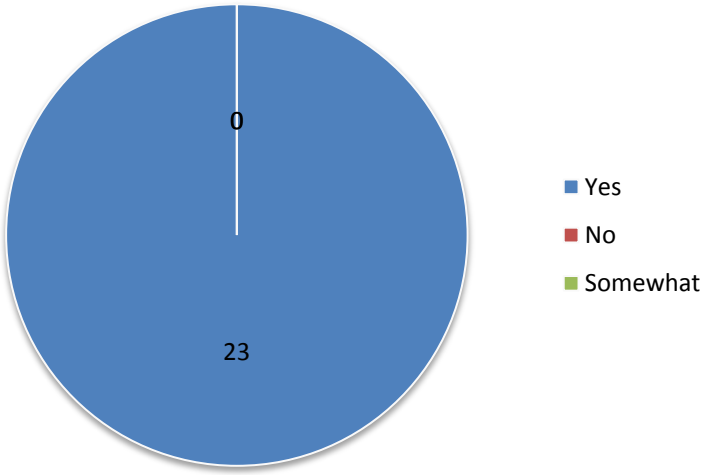


1	Specialties in endoscopy
2	All mighty relevant
3	Data on prevalence of specific errors in specific endoscopy settings in order to direct strategy
4	Brief overview on systems science
5	More time for implementation
6	Finance / HEE viewpoint
7	Very comprehensive – powerful patient input
8	Research and national and international collaboration through research networks, social media
9	Perhaps stronger patient presence – i.e more patients and auto service for future events
10	Patient voice and the paediatric perspective

6. What percentage of your time was well spent today?



7. **Would you be interested/ willing to take part in this work stream in future?**



8. **Any further comments**

1	Maybe slightly too much presentation
2	Excellent day, I learnt a lot
3	Would be good to have this as a 6/12 meeting to ensure we can implement changes, Siwan needs a pay rise
4	Excellent lots of food for thought, well done for organising
5	Very well organise. Innovative ways of promoting high quality discussion such as “blue sky thinking”
6	Happy to help JAG develop chartered
7	Happy to be involved in further work related to the day
8	An amazing day – well done all
9	Please ensure that you don’t just focus on endoscopy – safety for endoscopy cannot be viewed in isolation from other services
10	Happy to help JAG develop links with chartered institute on human factors and ergonomies
11	I think there is potential overkill about safe sedation because: • Levels of sedation given are now unbelievably low, flumazenil and naloxone use in my trust is pretty much zero and many patients have no sedation at all for routine diagnostic scopes • ERCP is an entirely different matte should all ERCP’s be done under GA – anaesthetist mandatory • Major polypectomy is a different matter as well but practised by relatively few clinicians • For the above reasons I believe mandating everyone to do a safe sedation course would be a bit much

Glossary

Word/ phrase	Explanation
Accreditation	The evaluation of an organisation's systems, processes or product that investigates whether defined standards and minimum requirements are satisfied
Audit	A quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change; clinical audits are central to effective clinical governance as a measure of clinical effectiveness
BSG	British Society of Gastroenterology
Clinical governance	A system through which healthcare providers and partners are accountable for continuously improving the quality of their services and safeguarding high standards of care by creating an environment in which excellence in clinical care can flourish
Clinical service leader	A named individual of a clinical service leadership team with responsibility for leading the clinical service
Clinical service strategy	An overarching approach of a clinical service that encompasses all plans, procedures and policies
Competence	Having the expertise, knowledge and/or skills, and in a clinical role the clinical and technical knowledge, required to carry out the role
DNA	Did not attend
Endoscopy service	A dedicated area where medical procedures are performed with endoscopes, which are cameras used to visualise structures within the body, such as the digestive tract and genitourinary system; endoscopy units may be located within a hospital, incorporated within other care centres, or may be stand-alone in nature
ESQAG	Endoscopy service quality assurance group is the JAG group responsible for providing expert advice and clinical governance over JAG work relating to services
GRS	Global Rating Scale is the JAG quality improvement tool which allows services to self-assess their performance against agreed standards and specific measures
JAG	The Joint Advisory Group on GI Endoscopy
KPI	Key performance indicator
Lead clinician	A named clinical staff member for a clinical specialty with a remit for leading the clinical staff within a clinical service *Note*: The lead clinician might have a non-medical role, eg a nurse or other registered professional
Leadership team	Clinical and managerial staff members with responsibility for leading a clinical service
Organisation	A legal, regulated body and location where clinical care is governed and provided or coordinated
Patient centred	Providing care and support that is respectful of and responsive to individual patient preferences, needs and values, and ensuring that patient values guide all clinical and support decisions
Policy	A document that states, in writing, a course or principles of action adopted by a provider and/or clinical service
Procedure	A specified way to carry out an activity or a process [*ISO 14971:2007 Medical*

Word/ phrase	Explanation
	devices – Application of risk management to medical devices, 2.12]
Quality	Quality is used in this document to denote a degree of excellence
QATWG	Quality assurance of training working group is the JAG group responsible for providing expert advice and clinical governance over JAG activity relating to training this includes certification, training courses, training centres and work relating to the JAG endoscopy training system (JETS).
Quality improvement plan	A document, or several documents, that together specify quality requirements, practices, resources, specifications, measurable objectives, timescales and the sequence of activities that are relevant to a particular clinical service or project to achieve the objectives within the timescales given
Risk assessment	A process used to determine risk management priorities for clinical service delivery, user treatment and/or care by evaluating and comparing the level of risk against healthcare provider standards, predetermined target risk levels or other criteria
Roster	A list or plan showing turns of duty or leave for individuals or groups in an organisation, clinical service or pathway
Skillmix	A combination of different types of staff members who are employed in a clinical service who have the required skills and competencies to carry out the work of the clinical service and deliver the pathway
Staff (workforce)	A person (clinically or non-clinically trained) working in the endoscopy service including those who are: • employed, clinical eg nurses, doctors, healthcare assistants and technicians • non-clinical eg administrative staff agency/bank/voluntary
Service user	A person who receives treatment and/or care from the endoscopy service and the defined population for whom that endoscopy service takes responsibility: examples of endoscopy service users are patients, carers and advocates
Trainee	A trainee is commonly known as an individual taking part in a trainee programme (eg medical or nursing) or who is an official employee of an endoscopy service who is being trained to the job he/she was originally hired for: literally an employee in training

Acknowledgements

Funding: Nick Sevdalis' research is supported by the NIHR Collaboration for Leadership in Applied Health Research and Care South London at King's College Hospital NHS Foundation Trust. NS is a member of King's Improvement Science, which is part of the NIHR CLAHRC South London and comprises a specialist team of improvement scientists and senior researchers based at King's College London. Its work is funded by King's Health Partners (Guy's and St Thomas' NHS Foundation Trust, King's College Hospital NHS Foundation Trust, King's College London and South London and Maudsley NHS Foundation Trust), Guy's and St Thomas' Charity, the Maudsley Charity and the Health Foundation. The views expressed are those of the authors and not necessarily those of the National Health Service, the NIHR or the Department of Health and Social Care.

Competing interests: NS is the director of London Training & Safety Solutions, which delivers patient safety assessment and training to hospitals on a consultancy basis.

References

Bowles, C. (2004). A prospective study of colonoscopy practice in the UK today: are we adequately prepared for national colorectal cancer screening tomorrow?. *Gut*, 53(2), pp.277-283.

Cancer Research UK (2015). Scoping the Future: an evaluation of endoscopy capacity across the NHS in England. [cited 25th April 2018]; Available from: https://www.cancerresearchuk.org/sites/default/files/scoping_the_future_-_final.pdf

Cullinane, M., Gray, A., Hargreaves, C., Lucas, S., Schubert, M., Sherry, K. and Wardle, T. (2004). *Scoping our practice: the 2004 report of the National Confidential Enquiry into Patient Outcome and Death*.

de Feijter, J., de Grave, W., Koopmans, R. and Scherpbier, A. (2012). Informal learning from error in hospitals: what do we learn, how do we learn and how can informal learning be enhanced? A narrative review. *Advances in Health Sciences Education*, 18(4), pp.787-805.

Gavin, D., Valori, R., Anderson, J., Donnelly, M., Williams, J. and Swarbrick, E. (2012). The national colonoscopy audit: a nationwide assessment of the quality and safety of colonoscopy in the UK. *Gut*, 62(2), pp.242-249.

Kalaitzakis, E. (2016). All-cause mortality after ERCP. *Endoscopy*, 48(11), pp.987-994.

Makary, M. and Daniel, M. (2016). Medical error—the third leading cause of death in the US. *BMJ*, p.i2139.

Jeurnink, S., Steyerberg, E., Kuipers, E. and Siersema, P. (2012). The burden of endoscopic retrograde cholangiopancreatography (ERCP) performed with the patient under conscious sedation. *Surgical Endoscopy*, 26(8), pp.2213-2219.

Matharoo, M., Haycock, A. and Sevdalis, N. (2014). Endoscopic non-technical skills team training: The next step in quality assurance of endoscopy training. *World Journal of Gastroenterology*, 20(46), p.17507.

Shenbagaraj, L., Thomas-Gibson, S., Stebbing, J., Broughton, R., Dron, M., Johnston, D., Shaw, T., Haboubi, H. and Green, J. (2018). Endoscopy in 2017: a national survey of practice in the UK. *Frontline Gastroenterology*, pp.flgastro-2018-100970.

Siau, K., Anderson, J., Beales, I., et al. (2017) PTU-013 Trends in certification for gastrointestinal endoscopy and variations between trainee specialties: results from the UK JETS database. *Gut*, 66(Suppl 2):A57.

Siau K, Dunckley P, Valori R, et al. (2018) Changes in scoring of Direct Observation of Procedural Skills (DOPS) forms and the impact on competence assessment. Endoscopy Published Online First: 2018/04/04. doi: 10.1055/a-0576-6667.

Shojania, K. and Dixon-Woods, M. (2016). Estimating deaths due to medical error: the ongoing controversy and why it matters: Table 1. *BMJ Quality & Safety*, pp.bmjqs-2016-006144.

Royal College of Anaesthetists. Safe Sedation Practice for Healthcare Procedures: Standards and Guidance. 2013 [cited 25 April 2018]; Available from: https://www.rcoa.ac.uk/system/files/PUB-SafeSedPrac2013.pdf.

Vincent, C. (2001). Adverse events in British hospitals: preliminary retrospective record review. *BMJ*, 322(7285), pp.517-519.

Vargo, J., DeLegge, M., Feld, A., Gerstenberger, P., Kwo, P., Lightdale, J., Nuccio, S., Rex, D. and Schiller, L. (2012). Multisociety sedation curriculum for gastrointestinal endoscopy. *Gastrointestinal Endoscopy*, 76(1), pp.e1-e25.