Safe endoscopy

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BACKGROUND

Gastrointestinal endoscopy has rapidly evolved over the last decade. The volume of diagnostic endoscopy coupled with advances in technology and therapeutic interventions has resulted in an expanded remit for endoscopy. This is in the context of an ageing population with associated complex comorbidity. In order to rise to this challenge and deliver an effective service, a considered analysis of endoscopy safety is required. The achievements made in the UK by the Joint Advisory Group for gastrointestinal endoscopy (JAG) through initiatives such as the Global Rating Scale (GRS) and the National Endoscopy Training programme, are significant and have set the endoscopy safety and quality agenda both nationally and internationally.

In 2000, endoscopy patients in England experienced variable and often substandard services with reported waiting times of up to a year.¹ In 2004, Bowles' study of colonoscopy practice in the UK outlined significant safety issues.² Suboptimal caecal intubation rates, inadequate patient consent processes and wide variation in safe sedation practices were highlighted as issues to be addressed. These findings were corroborated by the National Confidential Enquiry into Patient Outcomes and Death³ following gastrointestinal endoscopy, illustrating further examples of avoidable error.

In response to this, there have been significant improvements in endoscopy⁴ in the UK underpinned by addressing endoscopy training issues. This was primarily driven by the requirement for a national bowel cancer screening programme⁵ necessitating consistent high-quality practice with rigorous safety standards required for population-based screening.

There is no doubt that endoscopy across the UK has improved significantly and improving quality is an international aspiration. However, the goals have also

changed (getting to the caecum vs getting to the submucosa). Similarly, endoscopy is increasingly therapeutic and may be considered a surgical specialty. In light of this, we must recognise that the safety profile will change as technology and procedural indications develop and patient subgroups evolve.

The American Society for Gastrointestinal Endoscopy⁶ and the European Society for Gastrointestinal Endoscopy⁷ have issued specific guidance highlighting the importance of quality improvement. Such a proactive stance led by the profession independently, averts the risk of having 'performance indicators externally imposed'⁸ by regulatory bodies and reinforces the importance of these aspects for endoscopists themselves.

However, the demand for endoscopy and the pace of development have superseded the safety and quality infrastructure required to deliver a high-level service. Although endoscopy has a good safety profile, the approach to considering, evaluating and hence improving endoscopy patient safety is multifactorial. Endoscopy safety is a fundamental building block to endoscopy quality, which has received much attention through bowel cancer screening⁹ reorganisation of gastrointestinal (GI) bleed services¹⁰ and endoscopic retrograde cholangiopancreatography (ERCP) performance.^{11 12}

Endoscopy safety is complex. It comprises a balance of important factors: service provision, patient centeredness, effective training, safe staffing levels and teamwork, efficient endoscopy processes, a systems approach to error prevention and analysis of errors with a focus on learning from mistakes. Vigilance towards safety needs to be responsive and adaptive to the changing needs of the organisation, the team and the individual patient. Only by setting the foundation of safety and building towards high quality can we aspire to achieve excellence in endoscopy.

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RECENT DEVELOPMENTS

Advances in endoscopy patient safety require a team leadership approach able to unify clinical and administrative aspects of safety. The section below summarises five key aspects of endoscopy safety.

Technology

Advances in endoscope technology are rapid and varied. Current endoscopes are smaller and more flexible than their historic counterparts permitting safer manoeuvrability and more advanced minimally invasive intervention. The increasing availability of magnetic endoscopic imaging devices to anticipate and correct colonoscope loop formation contribute to safety (avoid pushing with loop and confirm caecal intubation) and enhance patient comfort. Advances in biliary endoscopy through cholangioscopy techniques¹³ enable direct visualisation of the bile ducts with the advantage of targeted biopsies. The increased practical utility of enhanced imaging through high definition scopes and adjunctive techniques such as narrow band imaging, magnification techniques and chromoendoscopy, aid better lesion detection and characterisation.¹⁴ Furthermore, tools such as wide angle scopes, endoscope caps and cuffs, enhance lesion detection and access facilitating safe therapeutic intervention.¹⁵

There is a subgroup of patients for whom endoscopic therapeutic intervention is potentially possible but may be technically challenging (eg, access to lesion secondary to adhesions) or minimally invasive endosurgical options (eg, Full-thickness Laparoendoscopic Excision¹⁶) may be preferential. In this situation, careful patient selection and collaborative decision making between the therapeutic endoscopist, laparoscopic surgeon anaesthetist and ultimately the patient can provide a safe definitive solution for the patient without all the attendant risks of open surgery and bowel resection.

Endoscopy unit infrastructure

The organisation of endoscopy services has been transformed by the systems created by JAG. The GRS provides a transparent approach to safety and performance at a unit level and a practical means of disseminating good practice more widely. Measurement of performance by key performance indicators (KPIs) enables suboptimal practice to be identified and rectified and good practice to be rewarded. The development of specialist therapeutic endoscopy services (ERCP, bowel cancer screening and upper GI therapy) with associated high standards of endoscopist accreditation are likely to have a ripple effect on performance with the associated team. Additionally, such practice provides a template for safety and incentivises improvements in the diagnostic service too. In addition, the focus on providing dedicated upper GI bleed networks addresses important safety issues for

these high-risk patients who often present out of hours with critical management decisions often taken by non-endoscopist physicians. Clear guidance on important aspects of endoscopy consent, preprocedural optimisation, safe sedation including anaesthetic supervised deep sedation, bowel preparation, polypectomy and trainee supervision are widely accepted and have positively impacted patient safety.

Training

Historically, endoscopy training has been experiential, opportunistic and with variable supervision with consequent variation in standards. The systematic training, assessment and accreditation approach implemented by JAG has transformed safety and quality. This structured training provides an international model of excellence and ensures a streamlined basic standard for endoscopists from all specialties. This approach represents a shift in conceptual thinking of competence from quantity of procedures to quality.¹⁷ Endoscopy assessments are undertaken using the validated 'Directly Observed Procedural Skills (DOPS) assessment tool'¹⁸ with further validated assessment tools targeting specific areas of practice: polypectomy training and assessment through the DOPyS¹⁹ tool has led to more focused training, from both the trainer and trainee perspectives. Non-technical skills (ENTS) ratings form part of the revised DOPS assessment tool and directs trainers' attention to explicitly articulating key aspects relating to communication and teamwork. Importantly, a highly skilled endoscopist does not equate to a competent endoscopy trainer, as this requires additional skill sets.²⁰ Continuing high-quality training is facilitated by hands on training with animal models, simulation training and 'train the trainers' courses disseminating optimal endoscopy training techniques further. The training outline for individual endoscopists and the unit as a whole has been well conceived and implemented through JAG, but does not yet formally address training of teams that deliver endoscopy.

Team working

There is an appreciation that teamwork in endoscopy is important and this is acknowledged within individual endoscopist training and endoscopy unit standards outlined in GRS. Similarly, there is an understanding that endoscopy patient safety does not start and end with the procedure. Patient selection, communication and decision-making are key skills often better examined within a multidisciplinary team. Clear guidance on local practices and indications for referral to a tertiary centre are required in cancer MDTs, where 'endoscopy patient' decisions are made. Similarly, the development of benign complex polyp MDTs help explore feasible treatment options and streamline best practice.

FUTURE POTENTIAL

The achievements in the UK endoscopy over the last decade have been immense and transformed the safety and quality profile of endoscopy and set the agenda internationally. However, endoscopy has changed significantly and we cannot afford to be complacent and accept 'standard' performance. The patients undergoing endoscopy, the nature of lesions suitable for endoscopic excision and the advanced techniques available support the premise that endoscopy safety and quality has to develop swiftly to keep pace if we are to strive towards a high-level service. How will this be achieved in the face of diminishing resources and the ever-increasing demands on healthcare? We propose future developments start with 'quick wins' that have been established in surgery and likely to be effective in endoscopy.

Expertise and subspecialisation

Endoscopy training strategies need to address the developments in endoscopy to meet competency requirements across the board. For example, assessment tools to address specific endoscopy situations such as emergency endoscopy for upper GI bleeding²¹ are in development and likely to play an important role in differentiating degrees of competence, particularly for high-risk cases.

However, subspecialisation in endoscopy is increasing. Patient selection by identifying the right patient for the appropriate intervention in a timely manner by the right operator is challenging. This is crucial particularly when considering effective patient-centred management, having collective insight and knowing when *not* to do a procedure as the risks outweigh potential benefits. As with surgical practice, we should focus on concentrating volume, experience and expertise within endoscopy and making our referral pathways more robust. Individual endoscopist and unit performance data should be accurate and transparent alongside long-term patient outcome data.

Error analysis

Endoscopy safety can be enhanced by addressing avoidable error. Medical error is commonplace and has been examined in endoscopy. Errors are frequent, multifactorial, deemed to be minor, recurrent and often not immediately consequential. However, analyses of more serious errors reveal that they often have a 'signature' of a series of preceding minor errors that are often known about within the system. These errors present invaluable learning opportunities for the individual endoscopist, the immediate team as well as the wider endoscopy organisation. The challenge is to identify and address these errors in a systematic fashion and to avoid future patient safety incidents. Moreover, there is an opportunity to share learning between organisations such that effective solutions can be rapidly adopted more widely. In

order to achieve this, a national endoscopy patient safety incident database looking at error beyond haemorrhage and perforation (relatively rare events) should be developed. In parallel, this would insidiously shift safety culture away from blame and towards an open attitude where the emphasis is on learning, strengthening systems flaws and preventing error.

Focused attention on teamwork

The development of team training to enhance performance is likely to be a significant step in improving endoscopy quality. The endoscopy team is well defined yet the roles and responsibilities are not always clearly articulated particularly in complex scenarios with extended teams, for example, emergency cases conducted in the operating theatre. Practical patient safety tools to enhance teamwork communication such as the endoscopy safety checklist are used by many units²² and now recommended by JAG. Team briefings and debriefings at the beginning and end of a list have the potential to identify, avert and prevent recurrent safety issues and educate different members of the team (administrative, management, nursing medical and surgical). Alongside team briefings, *effective*²³ use of a preprocedural checklist by all the key players (endoscopist, nurses, anaesthetist and allied members, eg, scrub nurse) is key to capturing relevant safety information. This standard has not yet been fully achieved at a national level and deserves attention, as it is an inexpensive, effective approach to safety all units can employ alongside other GRS standards.

Currently, there is no dedicated human factors and teamwork performance training strategy endorsed by JAG. Teamwork training opportunities are feasible and valuable²⁴ and will become increasingly important given the complexity and changing face of therapeutic endoscopy. Team training strategies should be developed and disseminated systematically through existing training mechanisms. Human factors and teamwork training increasingly feature in undergraduate training but need to be embedded in specialist training curricula such that these principles are understood prior to and alongside hands-on endoscopy training. Team training for specialist situations, for example, ERCP, emergency GI bleed endoscopy and joint endosurgical procedures, is a subsequent development and leads into simulation training to prepare endoscopists and teams for managing complications in these potentially high-risk situations.

CONCLUSION

The safety-risk balance in endoscopy needs to be considered for each individual patient and management options defined by what level of risk is acceptable to the individual patient. The safety-risk balance will not always be clear, but if we assure endoscopists are

insightful to these important skills outside the traditional KPIs, we can strive to offer considered, balanced safe and effective care to all endoscopy patients. By building endoscopy safety, we can further develop quality and strive for excellence in endoscopy.

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