

Reporting systems in gastrointestinal endoscopy: Requirements and standards facilitating quality improvement: European Society of Gastrointestinal Endoscopy position statement

Michael Bretthauer^{1,2}, Lars Aabakken², Evelien Dekker³,
Michal F Kaminski^{1,4}, Thomas Rösch⁵, Rolf Hultcrantz⁶, Stepan Suchanek⁷,
Rodrigo Jover⁸, Ernst J Kuipers⁹, Raf Bisschops¹⁰, Cristiano Spada¹¹,
Roland Valori¹², Dirk Domagk¹³, Colin Rees^{14,15} and Matthew D Rutter^{14,15},
on behalf of the ESGE Quality Improvement Committee

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Abstract

To develop standards for high quality of gastrointestinal endoscopy, the European Society of Gastrointestinal Endoscopy (ESGE) has established the ESGE Quality Improvement Committee. A prerequisite for quality assurance and improvement for all gastrointestinal endoscopy procedures is state-of-the-art integrated digital reporting systems for standardized documentation of the procedures. The current paper describes the ESGE's viewpoints on requirements for high-quality endoscopy reporting systems. The following recommendations are issued:

1. Endoscopy reporting systems must be electronic.
2. Endoscopy reporting systems should be integrated into hospital patient record systems.
3. Endoscopy reporting systems should include patient identifiers to facilitate data linkage to other data sources.
4. Endoscopy reporting systems shall restrict the use of free text entry to a minimum, and be based mainly on structured data entry.
5. Separate entry of data for quality or research purposes is discouraged. Automatic data transfer for quality and research purposes must be facilitated.
6. Double entry of data by the endoscopist or associate personnel is discouraged. Available data from outside sources (administrative or medical) must be made available automatically.
7. Endoscopy reporting systems shall enable the inclusion of information on histopathology of detected lesions; patient's satisfaction; adverse events; surveillance recommendations.
8. Endoscopy reporting systems must facilitate easy data retrieval at any time in a universally compatible format.
9. Endoscopy reporting systems must include data fields for key performance indicators as defined by quality improvement committees.

¹Department of Health Management and Health Economy and KG Jebsen Centre for Colorectal Cancer, University of Oslo, Oslo, Norway

²Department of Transplantation Medicine, Oslo University Hospital, Oslo, Norway

³Department of Gastroenterology and Hepatology, University of Amsterdam, Amsterdam, the Netherlands

⁴Department of Gastroenterological Oncology, The Maria Skłodowska-Curie Memorial Cancer Centre and Institute of Oncology, and Medical Center for Postgraduate Education, Warsaw, Poland

⁵Department of Interdisciplinary Endoscopy, University Hospital Hamburg-Eppendorf, Germany

⁶Karolinska Institutet, Karolinska University Hospital, Stockholm, Sweden

⁷Department of Internal Medicine, Charles University, Prague, Czech Republic

⁸Unidad de Gastroenterología, Hospital General Universitario de Alicante, Alicante, Spain

⁹Department of Gastroenterology and Hepatology, Erasmus MC University Medical Center, Rotterdam, the Netherlands

¹⁰Gastroenterology Department, University Hospital Leuven, Leuven, Belgium

¹¹Digestive Endoscopy Unit, Catholic University, Rome, Italy

¹²Department of Gastroenterology, Gloucestershire Royal Hospital, Gloucester, UK

¹³Department of Internal Medicine, Joseph's Hospital, Warendorf, Germany

¹⁴Department of Gastroenterology, University Hospital of North Tees, Stockton-on-Tees, UK

¹⁵School of Medicine, Durham University, UK

Corresponding author:

Michael Bretthauer, University of Oslo, Oslo, Norway.
Email: michael.bretthauer@medisin.uio.no

10. Endoscopy reporting systems must facilitate changes in indicators and data entry fields as required by professional organizations.

Keywords

Quality, reporting systems, electronic patient files, colonoscopy, guideline

Abbreviations

ESGE	European Society of Gastrointestinal Endoscopy
ICD	International Classification of Diseases
GI	gastrointestinal
MST	Minimal Standard Terminology
SNOMED CT	Systematized Nomenclature of Medicine – Clinical Terms
WHO	World Health Organization

Introduction

The endoscopy report is central in any endoscopy practice and facilitates the exchange of information about findings, therapy, clinical recommendations, adverse events and performance in relation to endoscopy procedures.

Similar to medical records in general, endoscopy reports have traditionally been using free text or unstructured text phrases, occasionally accompanied with photo-documentation. Free text phrases, however, prevent meaningful data extraction and are therefore a barrier for quality assurance in gastrointestinal endoscopy.

In recent years much effort has been put into the creation of a comprehensive terminology and coding system for gastrointestinal endoscopy.¹ The system, which has been approved by the World Health Organisation (WHO), is based on the 10th edition of the *International Classification of Diseases (ICD-10)* to allow description of every possible gastrointestinal endoscopic term. This created a platform to standardize language and terms used in gastrointestinal endoscopy. As a result, minimum standard terminology (MST) and other initiatives (such as SNOMED CT, see <http://www.ihtsdo.org/>) have evolved to aid unification of endoscopy reporting within and between countries.^{2–4}

Adequate monitoring of gastrointestinal endoscopy and assuring high quality of endoscopy services requires easy-to-perform data extraction from endoscopy reports of procedural data, patient characteristics and key quality indicators.⁵ Implementation of quality-assured and standardized endoscopy reporting systems in daily practice is feasible.⁵

The European Society of Gastrointestinal Endoscopy (ESGE) has established a quality

improvement committee to facilitate improvement of the global quality of endoscopy and the delivery of patient-centred endoscopy services, to promote a unifying theme of quality of endoscopy within ESGE activities, and to assist endoscopy units and endoscopists in achieving these standards. Amongst other activities, the committee will develop quality standards, guidance and position statements to promote quality in endoscopy.

The present paper describes the views of the ESGE on the requirements and standards of endoscopy reporting systems. The recommendations are summarized in Table 1.

Methods

The members of the ESGE Quality Improvement Committee were appointed by the ESGE governing board after recommendation by ESGE national societies. The authors of this paper are the chairs of all subcommittees of the ESGE Quality Improvement Committee, and the members of the task force ‘Reporting systems in gastrointestinal endoscopy’ under the subcommittee ‘Lower GI endoscopy’. A literature search on the topics described in this article was performed in February 2015 (by MB). Identified literature was reviewed and discussed among the authors. Image documentation by still photographs and videos are an important part of endoscopy reporting systems, but are not a topic of the present article; this paper focuses on the written features of endoscopy reports. The present article is a ‘position statement’ because there is a lack of adequate literature to support grading of recommendations. The views expressed in this article are derived by consensus amongst the authors. The final draft of the article was sent to two ESGE governing board members for review.

Electronic or paper-based

Recommendation: Endoscopy reporting systems must be electronic

Modern endoscopy reporting systems should be digital to permit continuous data monitoring. Electronic reporting and storage of text and images allows continuous monitoring for quality purposes at endoscopist,

Table 1. Recommendations: requirements for future endoscopic reporting systems

The following requirements for endoscopic reporting systems are crucial to help developing high-quality patient care in endoscopy and ensuring continuous measurement and reporting of endoscopy quality for individuals, centres and countries. These requirements shall serve as guidance for manufacturers of electronic endoscopy software systems, caregivers and policymakers alike.*

1. Endoscopy reporting systems must be electronic.
2. Endoscopy reporting systems should be integrated into hospital patient record systems.
3. Endoscopy reporting systems should include patient identifiers to facilitate data linkage to other data sources
4. Endoscopy reporting systems shall restrict the use of free text entry to a minimum, and be based mainly on structured data entry.
5. Separate entry of data for quality or research purposes is discouraged. Automatic data transfer for quality and research purposes must be facilitated.
6. Double entry of data by the endoscopist or associate personnel is discouraged. Available data from outside sources (administrative or medical) must be made available automatically.
7. Endoscopy reporting systems shall enable the inclusion of information on:
 - a. histopathology of detected lesions
 - b. patient's satisfaction
 - c. adverse events
 - d. surveillance recommendations.
8. Endoscopy reporting systems must facilitate easy data retrieval at any time in a universally compatible format.
9. Endoscopy reporting systems must include data fields for key performance indicators as defined by quality improvement committees.
10. Endoscopy reporting systems must facilitate changes in indicators and data entry fields as required by professional organizations.

*Image documentation by still photographs and videos are an important part of endoscopy reporting systems, but are not a topic of the present article; these recommendations focus on the written features of endoscopy reports.

unit, regional and national level. Furthermore, electronic reporting facilitates continuous access for all involved in the clinical management of individual patients, e.g. for multidisciplinary teams, and audit of complications and adverse events. It also enables comparison of digital images from repeated procedures. Finally, comprehensive endoscopy reporting systems when coupled with disinfection machines allow adequate track-and-tracing of equipment for early detection of potential flaws in disinfection and reprocessing. For all of these reasons, digital reporting has been shown to be cost-efficient⁶ and is a prerequisite for universal quality reporting.

Integrated or stand-alone

Recommendation: Endoscopy reporting systems should be integrated into hospitals patient record systems

Recommendation: Endoscopy reporting systems should include patient identifiers to facilitate data linkage to other data sources

Many endoscopy practices, either in hospitals or stand-alone, have institutional electronic patient record systems. Endoscopy reporting systems should ideally be integrated into these systems to facilitate use by other medical professionals and to allow data exchange between the endoscopy system and patient

record systems within the hospital and between connected hospitals.

Often, however, the manufacturers of institutional patient records systems do not have an endoscopy-reporting module in their portfolio. Providers of endoscopy reporting systems should ensure that their system communicates seamlessly with the main patient record systems of the hospital or institution. The main priority is the quality of endoscopy reporting without affecting the collection of the administrative and patient data needed to monitor the performance and quality of the endoscopy services.

Structured and standardized data entry

Recommendation: Endoscopy reporting systems shall restrict the use of free text entry to a minimum, and mainly be based on structured data entry

Free-text based reporting is strongly discouraged because it leads to incomplete data and low quality reporting of endoscopies.^{7–10} Endoscopy reporting systems need to use structured terminology whenever possible (in concordance with validated, standardized terminology), and limit the use of free-text data entry. Free-text should be restricted to individualized clinical recommendations at the end of the endoscopy report, addressing all relevant clinical questions. Other free text

fields are usually not required. The endoscopy reporting systems software need then to produce readable endoscopy reports for readers not specialized in endoscopy. A good report takes time to put together. Thus, clinics need to facilitate time to allow for the learning curve for fast application of electronic reporting systems.

Variables

Recommendation: Separate entry of data for quality or research purposes is discouraged. Automatic data transfer for quality and research purposes must be facilitated

Recommendation: Endoscopy reporting systems must include data fields for key performance indicators as defined by the ESGE quality improvement committees

A number of standards have been established for required endoscopy report contents.^{3,11} These have usually been developed by either clinical endoscopy interest groups, quality improvement groups or researchers. It is our viewpoint that there is no inherent conflict between these three and endoscopy reporting systems need to facilitate a minimum number of variables derived from all these three domains. Indeed, many of the required variables will relate to more than one of the domains. Rather than defining variables as clinical, quality or research, a minimal standard variable list should be defined for each procedure and included in endoscopy reporting systems. Endoscopy reporting systems also need to be able to allow extension of variables, as desired by local users on a case-by-case basis, and over time as endoscopy specialty advances. The minimal variable list should be uniform across all systems to facilitate data exchange and monitoring clinical service, quality improvement, and research across endoscopists, units and countries. We strongly encourage manufacturers to adhere to these standards.

Within the next two years, the ESGE quality improvement committee will provide minimal variable lists for each type of endoscopy procedure within the framework of the subcommittees for upper GI endoscopy, lower GI endoscopy, pancreatobiliary, and small bowel endoscopy, respectively.

Data entry

Recommendation: Double entry of data by the endoscopist or associate personnel is discouraged. Available data from outside sources (administrative or medical) must be made available automatically

Recommendation: Endoscopy reporting systems shall facilitate to include information on: histopathology of

detected lesions; patient's satisfaction; adverse events; surveillance recommendations.

Double entry of data, as currently occurs for quality improvement or research, is the principal barrier to obtaining quality assured reporting in daily practice. It therefore impedes continuous quality improvement and acquisition of important research data, and it can be a potential source of mistakes. Future endoscopy reporting systems need to be structured in such a way to enable reliable data entry and easy extraction of performance reports for quality improvement and research. Double data entry should not be needed in the current era, and is strongly discouraged.

Data such as histopathology results, patient comfort, patient satisfaction and post-procedure adverse events, should become an integral part of future endoscopy reporting systems. This can be achieved by automatic linkage between the endoscopy reporting system and other databases using unique patient identifiers.

Endoscopy systems should have an integrated quality assurance module. For example, a tracking system is necessary to monitor histopathology results to be sure that each resected lesion is clearly described (size, location, completeness of resection, container number), entered into the system and signed off by the responsible endoscopist. Quality control can be achieved by regular, automated cross checks with warnings when performance falls outside accepted parameters. Terminology and quality standards from other specialties (i.e. histopathology) need to be adapted through consensus between the different specialties.

Data output

Recommendation: Endoscopy reporting systems must facilitate easy data retrieval at any time in a universally compatible format

Endoscopy reporting systems must have functionality to enable automated data extraction to provide predefined reports of clinical performance, quality indicators (which will be provided by the ESGE committees) and research data. Ideally, systems should allow local teams to develop their customized data output reports.

Confounders

Patient and procedure characteristics such as patient age and gender, indication for the procedure, preparation, and previous surgery are important to interpret variations in performance between individual endoscopists. Therefore, endoscopy-reporting systems need to be able to provide different thresholds of acceptable performance based on case mix and other confounding patients and procedure characteristics. For each

patient, all variables registered need to be available for data analysis to monitor quality for research purposes. All data need to be easily transferable to spreadsheet and standard statistical software packages.

Continuous updating

Recommendation: Endoscopy reporting systems must facilitate changes in indicators and data entry fields as required by professional organizations

The development of more widespread and effective quality assurance, and new evidence are likely to generate new quality variables. Therefore endoscopy-reporting systems should be structured to enable changes, particularly incorporation of new variables, without major re-writes of the software.

The quality of quality control

Comprehensive quality measurements require manual data collection or linkages of several data systems (depending on safety regulations barriers). High-quality quality improvement requires high quality of all interacting databases. A recent study based on administrative databases showed that of 45 reported interval colon cancers, after careful patient record checks, 21 reports were found to be administrative errors.¹² The issue of quality control of quality control systems is a challenge which will be particularly important when quality drives reimbursement (pay for performance). Medical societies themselves have to establish rules how to deal with these issues, before they are installed by other bodies. The committee aims at contributing to this issue in its future work.

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Conflict of interest

Michael Bretthauer receives funds from Thieme Verlag for editorial work for *Endoscopy*. Evelien Dekker's department receives research support and equipment loans from Olympus Europe (for the last 10 years). Raf Bisschops has received: speaker's fees from Covidien (2009/2014) and Fujifilm (2013); a speaker's fee and hands-on training sponsorship from Olympus Europe (2013/2014); a speaker's fee and research support from Pentax Europe; and an editorial fee from Thieme Verlag as co-editor of *Endoscopy*. Cristiano Spada has received training support from Given Imaging

(2013 and 2014). Roland Valori is a director of Quality Solutions for Healthcare, a company providing consultancy for improving quality and training in healthcare. Colin Rees's department receives research funding from Olympus Medical, ARC Medical, Aquilant Endoscopy, Almirall, and Cook (from 2010 to the present). Matthew D. Rutter's department receives research funding from Olympus for a colitis surveillance trial (2014 to present). Lars Aabakken, Dirk Domagk, Rolf Hultcrantz, Rodrigo Jover, Michal F. Kaminski, Ernst J. Kuipers, Thomas Rösch and Stepan Suchanek have no competing interests.

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