



Quality measurement and improvement in advanced procedures

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Quality measurement and improvement appear feasible for advanced endoscopy, but much work remains. Although many areas need refinement, the widespread use, reporting, and publicizing of already known metrics must be achieved as quickly as possible. The use of such metrics will undoubtedly begin with individuals who are already confident their recorded metrics will look favorable, and others will then follow. Quality networks, such as the one developed for endoscopic retrograde cholangiopancreatography (ERCP), prove to be invaluable for assessing the feasibility of measurement, community (including international) variation, factors associated with improved performance, and perhaps even outcome measurement using surrogates. Delayed events and outcomes remain difficult to measure in such networks. Hopefully, the increased focus on quality will allow such metrics to be developed, collected, benchmarked, and endorsed much more quickly for newer, more advanced endoscopy techniques than they were for ERCP and EUS; these endoscopic tools have been around for about 40 and 30 years, respectively, yet are still young in terms of metric development. Although the volume is lower for advanced endoscopy, the stakes are higher, and as such, quality metric development and implementation are just as important as in routine endoscopy; however, because of the procedure complexity, the wide spectrum of indications and maneuvers, and advanced endoscopist attitudes, reaching consensus and enforcement may be more difficult. The public and the practice need such metrics, however, and we must move forward.

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Measuring and improving quality in endoscopy has proven challenging for routine endoscopy and colonoscopy; its extension to “advanced endoscopists” might prove even more difficult. The group of advanced endoscopists tends to be, by nature, somewhat nonconformist, known for thinking outside the box, and may act as “cowboys” or “cowgirls,” doing things others may be uncomfortable doing. In general, this group comprises a particularly skilled subgroup of endoscopists. “Reining” this group in to be judged and/or branded with something like a “report card” would likely be perceived as unnecessary and perhaps even insulting. This perception is certainly understandable; nevertheless, the

data indicate that sufficient variation in quality exists and that certain factors and interventions might result in quality improvement. We therefore must overcome the above perceptions as a group and proceed toward improving advanced endoscopy practice.

One might question whether advanced endoscopy, because it is performed in much lower volumes, merits enough priority for the development and improvement of quality metrics. Colonoscopy is performed over 14 million times a year in the United States, whereas endoscopic retrograde cholangiopancreatography (ERCP), with a volume of about 1 per 1000 population per year, is performed in only 15 to 30,000 Americans annually. However, death from colonoscopy is extremely rare, occurring in <5% of perforations (which occur themselves in ~1:1000 screening colonoscopies), corresponding to about 1000 deaths per year. For ERCP, death occurs in 1 in 1000 procedures, usually from severe pancreatitis, resulting in approximately 100 to 200 deaths per year; this number is less than that for colonos-

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copy, but certainly still in the same ballpark. Adding the morbidity of pancreatitis, which occurs in 5% of procedures (2%-10%), results in over 1500 predicted prolonged hospitalizations because of this procedure each year.

"Advanced" endoscopy can be defined in several ways, but this article will touch on skills generally acquired or honed in dedicated fellowships beyond core training, including ERCP, endoscopic ultrasound (EUS), mucosal/submucosal resection, and deep enteroscopy, along with comments on other advanced techniques. This article will also review the data regarding quality variation, measurement, and improvement in advanced endoscopy, with a particular emphasis on ERCP, wherein most of the data currently lie. ERCP also arguably has the biggest public health impact because of its high volume and complication rate.

ERCP

ERCP involves therapeutic interventions or advanced diagnostics (tissue sampling, manometry) involving the pancreatobiliary ductal systems. It can be used solely for simple diagnostics, although such use should be rare nowadays. ERCP is associated with significant morbidity (generally in the form of post-ERCP pancreatitis [PEP]) in 2% to 10% of patients, and the percentage can be even higher in certain subgroups.¹⁻¹⁰ Mortality, as previously stated, is estimated to occur in 1:1000 cases based on both trial/case-series data¹⁻¹⁰ and registry data.¹¹

In 2006, the most recent revision of ERCP quality indicators was published by a multisociety (American Society for Gastrointestinal Endoscopy [ASGE]/American College of Gastroenterology [ACG]) task force on endoscopy quality.¹² The revision included 9 indicators (Table 1).

This revision provided an excellent summary of the types of concerns in determining the quality of an ERCP or of an ERCP doctor/team, but it had some limitations, especially in the indications list, as discussed below. Timing of informed consent (eg, not just before the procedure for cases with sphincter or Oddi dysfunction [SOD]) was not addressed, death was not listed as an event to be discussed, prophylactic antibiotics were endorsed but are likely unnecessary for routine biliary obstruction, precut rate was highlighted but use of precut may not be a good quality indicator, and the metric for adverse event rates was only that "they be measured;" many of these issues are discussed below.

A table of appropriate indications was included in that document,¹² as well as a 3-tier difficulty grading scale. However, many of the indications were vague, and as a result, technically included both good indications and bad: biochemistry/imaging suggesting obstruction is listed, but could mean a magnetic resonance cholangiopancreatography (MRCP) showing a distal biliary stricture and an alkaline phosphatase level 5 times normal or could include a young woman with transaminase levels 1.5 times normal and a normal MRCP. The former might be quite appropriate, whereas the latter incurs a high risk and would be an

inappropriate ERCP unless performed at a tertiary center with the ability to perform manometry. Others indications such as "papillary stenosis" appear appropriate, but might be inappropriate outside of the realm of tertiary endoscopists who have manometry available. Still other indications described are really planned maneuvers rather than indications: "to perform a sphincterotomy" or "to place a stent" obviously encompass both "quality" reasons or indications to do these therapeutic maneuvers, as well as poorer reasons. This list likely requires further discussion and thought; some critiques and suggestions are included in Table 2.

What we know about the problem

The British Society of Gastroenterologists (BSG) published one of the most impressive audits ever done of ERCP endoscopists and units; their data answered many interesting questions and raised many others.¹³ A brief review of the results is worthwhile. The audit included 5 metro areas in England and comprised 5264 ERCPs. More than 90% of patients had 30-day follow-up, and more than 80% of eligible ERCPists and of eligible units participated, recording procedures over a mean of 6 months. Approximately one-third of centers were referral centers, and two-thirds "always" or "usually" had a trainee involved. Just under half did not perform more than 200 procedures per year, including training centers. Over half of the trainees performed less than 50 ERCPs, yet half intended to perform ERCP in practice. Just over half had multidisciplinary meetings and less than two-thirds had MRCP/EUS on site. Success was seen in approximately 70% of ERCPs, with 1 in 4 needing a repeat procedure. Native papilla biliary cannulation success rate was 84%, with 77% of doctors having cannulation succeed in over 80%. Precut was done in 9% and was successful in two-thirds of those. Stone removal and stent insertions were successful in 62% and 73%, respectively. Adverse events occurred in 5% with 0.4% mortality. These results showed community variability and room for improvement.

Indications

The discussion regarding the best "list" of appropriate indications for ERCP is complex. However, the issue of indications is important and represents the major reason for lawsuits involving ERCP.^{14,15} Judgment in assessing the need for ERCP may be improved with training and experience. Most experts feel that the majority of ERCPs, in an era of excellent noninvasive imaging, should be therapeutic, and that the rate of therapeutics can be used as a surrogate of the appropriateness of the indications. Using billing databases in Alberta, Canada, the lowest volume ERCPists were shown to have the highest proportions of nontherapeutic procedures.¹⁶

Briefly, a few basic concepts (Table 1) frame the indications discussion. MRCP and EUS are widely available and highly accurate for biliary disease.^{17,18} Therefore, for

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