



# QUALITY IN ENDOSCOPY

ESGE / ESPEN SYMPOSIUM

## IBD & NUTRITION

Dublin, Ireland March 31-April 1, 2017

### **Performance measures for lower gastrointestinal endoscopy: a European Society of Gastrointestinal Endoscopy (ESGE) Quality Improvement Initiative**

Name: Michal F. Kaminski, MD, PhD

Institution: Dept. of Cancer Prevention and Dept. of Gastroenterological Oncology  
Center of Oncology Institute, Warsaw, Poland  
Medical Centre for Postgraduate Education, Warsaw, Poland  
Institute of Health and Society, Univeristy of Oslo, Norway



# Disclosures

---

I (and if applicable, my spouse/partner) disclose the following financial relationship with a commercial interest:

- Olympus Polska, Speaking and Teaching
- Alfa Wassermann, Advisory Board



# Performance measures for lower gastrointestinal endoscopy: a European

United European Gastroenterology Journal  
0(0) 1–26

This article is published simultaneously in  
the journals *Endoscopy* and the *United  
European Gastroenterology Journal*.

Copyright 2017 © Georg Thieme Verlag KG

Guideline



## Performance measures for lower gastrointestinal endoscopy: a European Society of Gastrointestinal Endoscopy (ESGE) Quality Improvement Initiative



### Authors

Michal F. Kaminski<sup>1,2,3</sup>, Siwan Thomas-Gibson<sup>4</sup>, Marek Bugajski<sup>1,2</sup>,  
Michael Bretthauer<sup>3,5</sup>, Colin J. Rees<sup>6</sup>, Evelien Dekker<sup>7</sup>, Geir Hoff<sup>3,8,9</sup>,  
Rodrigo Jover<sup>10</sup>, Stepan Suchanek<sup>11</sup>, Monika Ferlitsch<sup>12</sup>, John  
Anderson<sup>13</sup>, Thomas Roesch<sup>14</sup>, Rolf Hultcranz<sup>15</sup>, Istvan Racz<sup>16</sup>,  
Ernst J. Kuipers<sup>17</sup>, Kjetil Garborg<sup>3</sup>, James E. East<sup>18</sup>, Maciej Rupinski<sup>1,2</sup>,  
Birgitte Seip<sup>19</sup>, Cathy Bennett<sup>20</sup>, Carlo Senore<sup>21</sup>, Silvia Minozzi<sup>21</sup>,  
Raf Bisschops<sup>22</sup>, Dirk Domagk<sup>23</sup>, Roland Valori<sup>24</sup>, Cristiano Spada<sup>25</sup>,  
Cesare Hassan<sup>26</sup>, Mario Dinis-Ribeiro<sup>27,28</sup>, Matthew D. Rutter<sup>29,30</sup>

- 16 Department of Internal Medicine and Gastroenterology, Petz Aladar County and Teaching Hospital, Győr, Hungary
- 17 Department of Gastroenterology and Hepatology, Erasmus MC University Medical Center, Rotterdam, The Netherlands
- 18 Translational Gastroenterology Unit, John Radcliffe Hospital, University of Oxford, Oxford, UK
- 19 Department of Gastroenterology, Vestfold Hospital Trust, Tønsberg, Norway
- 20 Centre for Technology Enabled Research, Faculty of Health and Life Sciences, Coventry University, Coventry, UK

Quality indicators for colonoscopy

Colonoscopy is widely used for the diagnosis and treatment of colon disorders. Properly performed, colonoscopy is generally safe, accurate, and well-tolerated. Visualization of the mucosa of the entire large intestine and distal terminal ileum usually is possible during colonoscopy. Polyps can be removed during colonoscopy, thereby reducing the risk of colon cancer. Colonoscopy is the preferred method to evaluate the colon in most adult patients with large-bowel symptoms, iron deficiency anemia, abnormal results on radiographic studies of the colon, positive results on colorectal cancer (CRC) screening tests, post-polypectomy and post-cancer resection surveillance, and diagnosis and surveillance in inflammatory bowel disease. In addition, colonoscopy is the most commonly used CRC screening test in the United States.<sup>1</sup> Based on 2010 data, over 3.3 million outpatient colonoscopies are performed annually in the United States, with screening and polyp surveillance accounting for half of indications.<sup>2</sup>

Optimal effectiveness of colonoscopy depends on patient acceptance of the procedure, which depends mostly on acceptance of the bowel preparation.<sup>3</sup> Preparation quality affects the completeness of examination, procedure duration, and the need to cancel or repeat procedures at earlier dates than would otherwise be needed.<sup>4,5</sup> Ineffective preparation is a major contributor to costs.<sup>6</sup> Meticulous inspection<sup>7,8</sup> and longer withdrawal times<sup>9-14</sup> are associated with higher adenoma detection rates (ADR). A high ADR is essential to rendering recommended intervals<sup>15</sup> between screening and surveillance examinations safe.<sup>16,17</sup> Optimal technique is needed to ensure a high probability of detecting dysplasia when present in inflammatory bowel disease.<sup>17-21</sup> Finally, technical expertise and experience will help prevent adverse events that might offset the benefits of removing neoplastic lesions.<sup>22</sup>

Recent studies report that colonoscopy is less effective in preventing proximal colon cancer and cancer deaths (ie, colon cancer proximal to the splenic flexure) compared with distal cancer (ie, colon cancer at or distal to the splenic flexure).<sup>23-28</sup> Decreased protection against right-sided CRC is likely due to multiple factors. These include adenoma

lesions that are endoscopically subtle or difficult to remove, such as sessile serrated polyps and flat and/or depressed adenomas, and differences in tumorigenesis between right-sided and left-sided cancers. Improving prevention of right-sided colon cancer is a major goal of colonoscopy quality programs. Five studies have established that gastroenterologists are more effective than surgeons or primary care physicians at preventing CRC by colonoscopy.<sup>27,29-32</sup> This most likely reflects higher rates of complete examinations (ie, cecal intubation)<sup>30</sup> and higher rates of adenoma detection among gastroenterologists.<sup>33,34</sup> All endoscopists performing colonoscopy should measure the quality of their colonoscopy. Institutions where endoscopists from multiple specialties are practicing should reasonably expect all endoscopists to participate in the program and achieve recommended quality benchmarks. The quality of health care can be measured by comparing the performance of an individual or a group of individuals with an ideal or benchmark.<sup>35</sup> The particular parameter that is being used for comparison is termed a quality indicator. A quality indicator often is reported as a ratio between the incidence of correct performance and the opportunity for correct performance<sup>4</sup> or as the proportion of interventions that achieve a predefined goal.<sup>35</sup> Quality indicators can be divided into 3 categories: (1) structural measures—these assess characteristics of the entire health care environment (eg, participation by a physician or other clinician in systematic clinical database registry that includes consensus endorsed quality measures), (2) process measures—these assess performance during the delivery of care (eg, ADR and adequate biopsy sampling during colonoscopy for chronic ulcerative colitis), (3) outcome measures—these assess the results of the care that was provided (eg, the prevention of cancer by colonoscopy and reduction in the incidence of colonoscopic perforation).

METHODOLOGY

These indicators are used to measure the quality of care provided by endoscopists. The purpose of this study was to identify quality indicators for colonoscopy that are not overlapping with previously proposed quality indicators and new quality indicators for performing colonoscopy.<sup>36</sup> Indicators that had wide-ranging clinical application, were associated with

**Key words:**  
 • measurement  
 • colonoscopy  
 • endoscopy  
 • colonoscopy  
 • flexible sigmoidoscopy  
 • evidence-based  
 • multi-disciplinary  
 • based program

**Corresponding author:**  
**J. Kumbalesh, MD**  
 Centre for Digestive Diseases  
 The General Infirmary at  
 Department of  
 Gastroenterology  
 Leeds LS1 3EX  
 United Kingdom  
 Tel: +44-113486559  
 j.kumbalesh@leeds.ac.uk

**Key words:**  
 • measurement  
 • colonoscopy  
 • endoscopy  
 • colonoscopy  
 • flexible sigmoidoscopy  
 • evidence-based  
 • multi-disciplinary  
 • based program

**Corresponding author:**  
**J. Kumbalesh, MD**  
 Centre for Digestive Diseases  
 The General Infirmary at  
 Department of  
 Gastroenterology  
 Leeds LS1 3EX  
 United Kingdom  
 Tel: +44-113486559  
 j.kumbalesh@leeds.ac.uk

Copyright © 2015 American College of Gastroenterology  
 0016-5107/15/3600  
<http://dx.doi.org/10.1016/j.gie.2014.07.038>

key Performance Measures

minor Performance Measures

44 not overlapping PMs !

# Lower GI Quality Domains

---

1. Pre-procedure
2. Completeness of procedure
3. Identification of pathology
4. Management of pathology
5. Complications
  - Competence of endoscopists
6. Patients experience
7. Post-procedure

1 kPM

Rutter MD, et al. Endoscopy and UEG J, 2016  
Bretthauer M, et al. Endoscopy and UEG J, 2016  
Bisschops R, et al. Endoscopy and UEG J, 2016  
Kaminski MF, et al. Endoscopy and UEG J, 2017

# 1. Pre-procedure

<b>k PM</b>	<b>Rate of adequate bowel preparation</b>
<b>Construct</b>	<u>Denominator</u> : Patients undergoing colonoscopy <u>Numerator</u> : Patients in denominator with adequate bowel preparation using validated scale (excl. emergency) <u>Calculation</u> : Proportion (%) <u>Level of analysis</u> : Service and individual
<b>Standards</b>	Minimum: $\geq 90\%$ Target: $\geq 95\%$
<b>Consensus Agreement</b>	100%
<b>Evidence Grading</b>	Moderate quality evidence

# Evidence: **Rate of adequate bowel preparation**

---

## Importance

- Associated with ADR and CIR
- Repeated exam: cost and inconvenience

## Scientific acceptability

- Validated scales (ADR, advADR)
- Adequate: BBPS $\geq$ 6 Ottawa $\leq$ 7, Aronchick exl.-fair

## Feasibility

- $\geq$ 90% measured in population-based studies

## 2. Completeness of procedure

---

<b>k PM</b>	<b>Cecal intubation rate</b>
<b>Construct</b>	<u>Denominator</u> : Patients undergoing colonoscopy <u>Numerator</u> : Patients in denominator reached cecum + photo (excl. Emergency & specific therapeutic) <u>Calculation</u> : Proportion (%) <u>Level of analysis</u> : Service and individual
<b>Standards</b>	Minimum: $\geq 90\%$ Target: $\geq 95\%$
<b>Consensus Agreement</b>	97.9%
<b>Evidence Grading</b>	Moderate quality evidence



# Evidence: **Cecal intubation rate**

---

## Importance

- Cecal photo associated with PDR
- Repeated exam: cost and inconvenience

## Scientific acceptability

- Well defined landmarks
- CIR <80% associated with interval CRC

## Feasibility

- $\geq 95\%$  measured in population-based studies

### 3. Identification of pathology

---

<b>k PM</b>	<b>Adenoma detection rate (ADR)</b>
<b>Construct</b>	<u>Denominator</u> : Patients $\geq 50$ years of age undergoing cspy <u>Numerator</u> : Patients in denominator with $\geq 1$ adenoma (excl. Emergency & specific therapeutic) <u>Calculation</u> : Proportion (%) <u>Level of analysis</u> : Service and individual
<b>Standards</b>	Minimum: $\geq 25\%$ Target: not defined
<b>Consensus Agreement</b>	100%
<b>Evidence Grading</b>	Moderate to high quality evidence

# Evidence: **Adenoma detection rate**

---

## Importance

- 2-10 fold variation among endoscopist
- Associated with interval CRC and CRC death

## Scientific acceptability

- Well defined with low risk of gaming
- Susceptible for improvement

## Feasibility

- $\geq 25\%$  reached in recent population-based studies

## 4. Management of pathology

---

<b>kPM</b>	<b>Appropriate polypectomy technique</b>
<b>Construct</b>	<u>Denominator</u> : Polyps >3mm in size removed at colonoscopy <u>Numerator</u> : Polyps in the denominator removed with snare polypectomy (cold/diathermy) <u>Calculation</u> : Proportion (%) <u>Level of analysis</u> : Service and individual
<b>Standards</b>	Minimum: $\geq 80\%$ Target: $\geq 90\%$
<b>Consensus Agreement</b>	100%
<b>Evidence Grading</b>	Low quality evidence

# Evidence: **Appropriate polypectomy technique**

---

## Importance

- 3 fold variation in incomplete resection
- Incomplete resection: up to 25% of iCRC

## Scientific acceptability

- Biopsy forceps resection inferior to snare for polyps  $\geq 4\text{mm}$

## Feasibility

- Easy to retrieve from electronic reports
- $\geq 72\text{-}90\%$  polyps  $> 3\text{mm}$  resected with snare

# 5. Complications

---

<b>kPM</b>	<b>Complication rate</b>
<b>Construct</b>	<u>Denominator</u> : All colonoscopies <u>Numerator</u> : Denominator with a complication registered (early compl. + 7-day readmission + 30-day mortality rate) <u>Calculation</u> : Proportion (%) <u>Level of analysis</u> : Service
<b>Standards</b>	Minimum: $\leq 0.5\%$ 7-day readmissions, N/A Target: N/A
<b>Consensus Agreement</b>	93.8%
<b>Evidence Grading</b>	Low quality evidence

# Evidence: **Complication rate**

---

## Importance

- 6(7)-day readmission predicts mortality rate
- Lengthening hospital stay, add. procedure

## Scientific acceptability

- 30-day mortality and 7-day readmission well defined and significant for patient

## Feasibility

- Administrative data claims
- Direct phone call or hospital records

## 6. Patient experience

---

<b>kPM</b>	<b>Patient experience</b>
<b>Construct</b>	<u>Denominator</u> : All colonoscopies <u>Numerator</u> : Denominator with patient experience measured <u>Calculation</u> : Proportion (%) <u>Level of analysis</u> : Service and individual
<b>Standards</b>	Minimum: Unknown Target: $\geq 90\%$
<b>Consensus Agreement</b>	93.8%
<b>Evidence Grading</b>	Very low quality evidence



# Evidence: **Patient experience**

---

## Importance

- Potentially painful and embarrassing

## Scientific acceptability

- Intra- and post-procedure pain levels
- Validated questionnaires (Gastronet & Global Rating Scale)
- Patient recorded pain & VAS/VRS-4

## Feasibility

- 80-90% coverage with Gastronet / GRS

# 7. Post procedure

---

<b>kPM</b>	<b>Appropriate post-polypectomy surveillance recommendations</b>
<b>Construct</b>	<u>Denominator</u> : Patients after colorectal polypectomy <u>Numerator</u> : Denominator with proper recommendations <u>Calculation</u> : Proportion (%) <u>Level of analysis</u> : Service and individual
<b>Standards</b>	Minimum: Unknown Target: $\geq 95\%$
<b>Consensus Agreement</b>	93.8%
<b>Evidence Grading</b>	Low quality evidence

## Evidence: **Appropriate post-polyp. surveillance**

---

### Importance

- Surveillance: balance between benefit (CRC prevention) & harms (too frequent, invasive)
- < 30% patient compliance

### Scientific acceptability

- Recommendations by gastroenterologist / PCP strongest predictor of compliance

### Feasibility

- Endoscopy reporting systems

# Summary of lower GI Performance measures

