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Performance measures for upper gastrointestinal endoscopy: a European Society of Gastrointestinal Endoscopy (ESGE) Quality Improvement Initiative – Update 2025

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ABSTRACT

Quality markers and patient experience should be implemented to ensure standardization of practice across upper gastrointestinal (UGI) endoscopy procedures. The set benchmarks ensure high quality procedures are delivered and linked to measurable outcomes. In 2016, the European Society of Gastrointestinal Endoscopy (ESGE), via its Quality Improvement Committee's UGI Working Group, set a first list of performance measures, including major (key) and minor performance indicators. This paper provides an update on those performance measures, considering the latest literature.

Patients referred for a UGI endoscopy should have an appropriate indication and be fasting for ≥2 hours for liquids and ≥6 hours for solids.

For a diagnostic UGI endoscopy, patients should have an allocated time slot of ≥20 minutes; adequate reporting should include a mucosal visibility score according to one of the available standardized and validated scales; adequate photodocumentation should include relevant normal anatomical landmarks and all abnormal findings; adequate inspection should include the esophagus, stomach, and duodenum, and should last ≥7 minutes from intubation to extubation; adequate terminology should include the description of any abnormal finding according to the available standardized and validated classifications.

For patients with nondysplastic Barrett's esophagus (BE) undergoing surveillance UGI endoscopy, an adequate inspection should take ≥1 minute/cm of circumferential extent of Barrett's epithelium and include the use of chromoendoscopy (acetic acid and/or virtual); biopsies should be taken according to the Seattle protocol.

Adequate inspection for a diagnostic UGI endoscopy in patients with a history of ear, nose, and throat, or lung tumors treated with curative intent should include the use of virtual chromoendoscopy.

Adequate diagnostic UGI endoscopy for patients evaluated for their risk of gastric cancer should include biopsies taken according to the ESGE management of precancerous conditions and lesions in the stomach (MAPS) guideline.

Adequate safety after a therapeutic UGI endoscopy should be assessed by monitoring the incidence of complications.

Patients undergoing a diagnostic UGI endoscopy should have their experience measured using a validated scale, to promote a patient-centered and quality-driven environment.

Patients with nondysplastic BE or gastric precancerous conditions in an endoscopic surveillance program should be monitored for guideline interval adherence.

ABBREVIATIONS

AE	adverse event
BE	Barrett's esophagus
EGGIM	Endoscopic Grading for Gastric Intestinal Metaplasia
ENDOPREM	Newcastle ENDOscopic Patient-Reported Experience Measure
ESGE	European Society of Gastrointestinal Endoscopy
GESQ	Gastrointestinal Endoscopy Satisfaction Questionnaire
mGHAA-9	Modified Group Health Association of America-9
GRACE	Gastroscopy Rate of Cleanliness Evaluation
MAPS	management of precancerous conditions and lesions in the stomach
OLGA	Operative Link for Gastritis Assessment
OR	odds ratio
OLGIM	Operative Link on Gastric Intestinal Metaplasia Assessment
PEACE	Polprep Effective Assessment of Cleanliness in Esophagogastroduodenoscopy
PICO	population/patient, intervention/indicator, comparator/control, outcome
PREM	patient-reported experience measure
RCT	randomized controlled trial
RR	risk ratio
SCC	squamous cell carcinoma
UGI	upper gastrointestinal

Introduction

The European Society of Gastrointestinal Endoscopy (ESGE) created a Quality Improvement Committee to promote global quality of gastrointestinal endoscopy, to deliver a patient-centered endoscopy service, and to encourage a unifying theme of quality of gastrointestinal (GI) endoscopy. Its aims include to review, consolidate, and/or update endoscopy quality and performance measures as high level evidence becomes available. Several groups for different GI procedures were created, and each provided a first series of published proposals for performance measures to implement and measure, which included a position statement specific for upper GI (UGI) endoscopy, published in 2016 [1].

The new members of the ESGE UGI Working Group approved in 2020 aimed, among other tasks, to review the previous list of performance measures, defined as specific issues amenable to quantification, allowing for comparison and potential improvement, which were relevant in clinical practice and represented the minimally acceptable standard of care, in line with the most recent available evidence.

The following proposed performance measures have been reviewed according to the available updated literature, but also keeping in mind their applicability in real-world practice, to ensure they continue to be applicable and meaningful to any endoscopy service worldwide.

Methodology

The performance measures were updated using a multistep methodological process. For each previously identified domain, the ESGE UGI Working Group members were invited to review the literature since 2015 in groups of three, according to their personal interests. The previous domains included pre-procedure, intraprocedure, and post-procedure topics. Moreover, according to each member's personal interests and knowledge, any new performance measures that might eventually arise from the recent literature were also proposed.

For each performance measure previously identified and/or newly proposed, a structured query was then created using the PICO framework, where P stands for Population/Patient, I for Intervention/Indicator, C for Comparator/Control, and O for Outcome, looking for any recent evidence to support and/or update the performance measures.

Based on the evidence provided by the queries, previous statements were updated or new statements were created, and these were made available for a Delphi voting process, where all ESGE UGI Working Group and ESGE Governing Board members were invited to participate. During the Delphi voting, statements were graded on a 5-point Likert scale (1, Strongly Disagree; 2, Disagree; 3, Neither Agree nor Disagree; 4, Agree; 5, Strongly Agree), via a web-based platform.

Consensus was defined as an agreement of ≥ 80 % (the sum of "Agree" and "Strongly Agree") on each statement, which had to be achieved twice. A free-text box was available for each statement for comments or suggestions. When voting, participants were asked to consider the clinical benefits and harms for patients and healthcare systems, costs, quality of evidence, and the environmental impact of the statements. Evidence-based texts were provided to all members.

In total, invited members participated in three rounds of voting, followed by an extended consensus meeting to agree on performance measures in the predefined domains and their respective classification as key or minor performance measures, according to their clinical relevance and widespread applicability. The performance measures are displayed in boxes under the relevant domain. Each box describes the performance measure, the rationale behind its adoption, the way the score should be calculated, the agreement on acceptance during the modified Delphi process, and the grading of the available evidence.

In general, performance measures are proposed to be calculated as proportions (%) at service level, yearly, for a sample of 100 consecutive UGI endoscopies. For most statements, performance measures are applicable and should be calculated for any diagnostic UGI endoscopy in a patient who has not undergone previous removal of any part of the esophagus,

stomach, or duodenum. Therefore, for almost all performance measures, UGI endoscopy sampling should not include therapeutic procedures, emergency procedures, procedures with a specific diagnostic purpose without the need for a full evaluation (e. g. evaluation of a perforation), early termination of a UGI endoscopy owing to patient intolerance or for reasons of safety, or alteration of the normal anatomy in the UGI tract, such as previous oncological resection or bariatric surgery.

Audit and calculation of the proportions for each performance measure should be easily available in the endoscopy report, in specific fields if available by the reporting software, or written in a free-text format. The exclusions should also be easily available in the indication section. The exceptions for this easy audit are the domains regarding complications and post-procedure, which will require access to the patient's clinical file and the patient experience, implying delivery of a specific questionnaire. For this last point, we again propose the delivery of the questionnaire to a sample of 100 consecutive patients who underwent UGI endoscopy.

Finally, owing to the lack of robust evidence regarding the standards to reach for each performance measure, a broad proposal of a minimum standard ≥ 90 % and a target standard ≥ 95 % is suggested. If the minimum standard is not reached, analysis on an individual level should be performed to identify targets for improvement.

Performance measures for upper gastrointestinal endoscopy

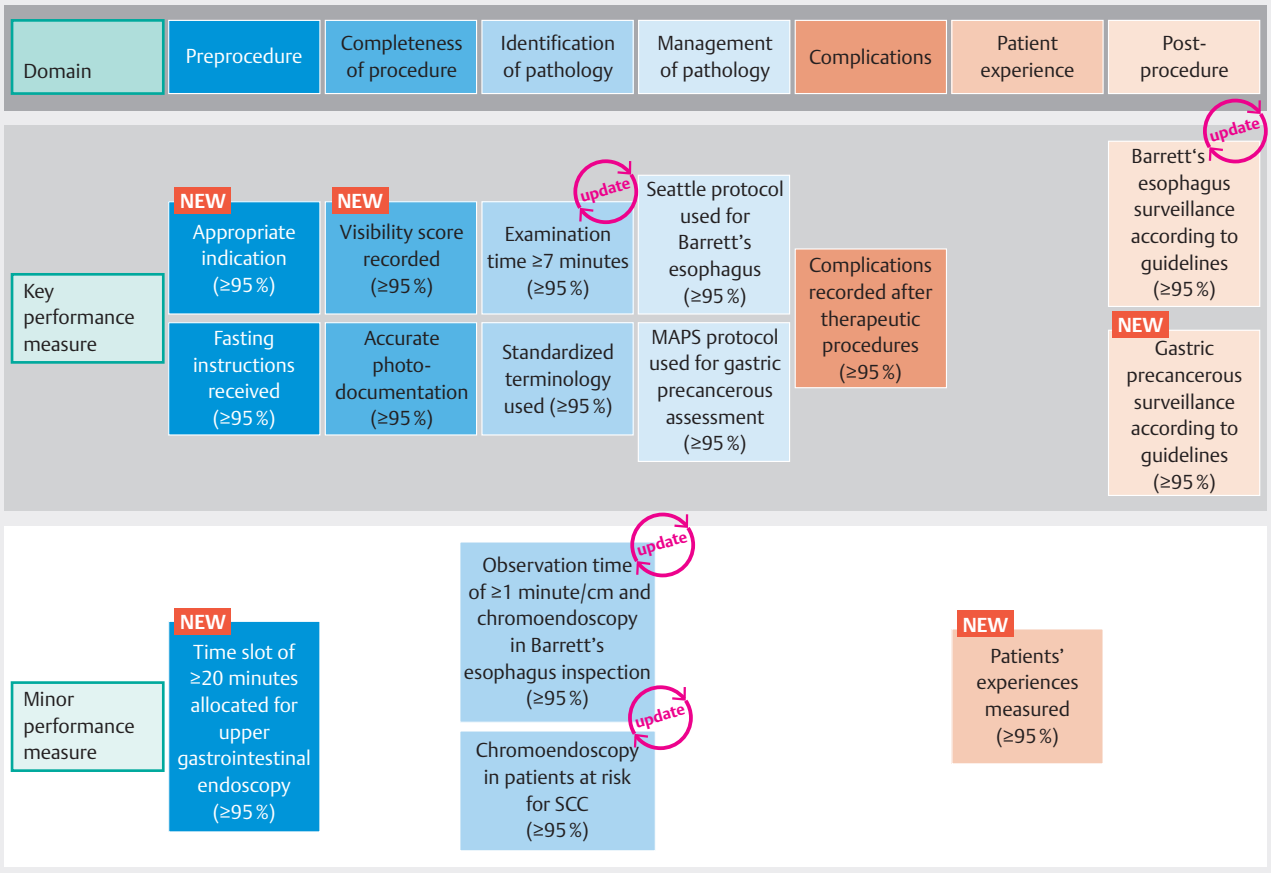
The Working Group agreed on 15 performance measures in total, after three rounds of Delphi voting (▶ **Fig. 1**). These were divided into eleven key and four minor performance measures, based on their applicability and the magnitude of their impact on patient outcomes, although all are relevant for quality improvement. In ▶ **Table 1**, the current performance measures are displayed alongside the previous ones, for comparison and easier detection of updates.

The evidence quality, as graded according to the Grading of Recommendations Assessment, Development and Evaluation (GRADE) criteria, continues to be low in general, similarly to our findings in the previous 2016 publication [1, 2]. However, we continue to think that these performance measures are feasible to implement and might impact on patients' clinical outcomes and satisfaction. Endoscopy departments with limited

▶ **Table 1** Description of the performance measures in the current and previous position statements.

Current proposals	Previous proposals
Key performance measures	
Appropriate indication	–
Fasting instructions received	Fasting instructions prior to UGI endoscopy
Visibility score recorded	–
Accurate photodocumentation	Accurate photodocumentation of anatomical landmarks and abnormal findings
Examination time ≥ 7 minutes	Documentation of procedure duration
Standardized terminology used	Accurate application of standardized disease-related terminology
Seattle protocol used for BE	Application of Seattle protocol in Barrett's surveillance
MAPS protocol used for gastric precancerous assessment	Application of validated biopsy protocol to detect gastric intestinal metaplasia (MAPS guidelines) (minor)
Complications recorded after therapeutic procedures	Accurate registration of complications after therapeutic UGI endoscopy
BE surveillance according to guidelines	Prospective registration of Barrett's patients (minor)
Gastric precancerous conditions surveillance according to guidelines	–
Minor performance measures	
Time slot of ≥ 20 minutes allocated for upper gastrointestinal endoscopy	–
Observation time of ≥ 1 minute/cm and chromoendoscopy in BE inspection	Minimum 1-minute inspection time per cm circumferential Barrett's epithelium
Chromoendoscopy in patients at risk for squamous cell carcinoma	Use of Lugol chromoendoscopy in patients with a curatively treated ENT or lung cancer to exclude a second primary esophageal cancer
Patients' experiences measured	–
–	Minimum 7-minute procedure time for first diagnostic UGI endoscopy and follow-up of gastric intestinal metaplasia

BE, Barrett's esophagus; ENT, ear, nose, and throat; MAPS, management of precancerous conditions and lesions in the stomach; UGI, upper gastrointestinal.



▶ **Fig. 1** Domains and performance measures for upper gastrointestinal endoscopy.
MAPS, management of precancerous conditions and lesions in the stomach; SCC, squamous cell carcinoma.

access to electronic software and dependent on manual monitoring might prefer initially to take a limited approach to the key performance measures, until a quality culture is implemented and automatic tools become available [3].

The PICO queries that were used during the modified Delphi process to develop the performance measures can be found in **Appendix 1 s**, see online-only Supplementary material.

1 Domain: Pre-procedure

Key performance measure	Indications
Description	The upper gastrointestinal (UGI) endoscopy report should include an explicit appropriate indication for the procedure
Domain	Pre-procedure
Category	Process
Rationale	UGI endoscopies with an appropriate indication are safer and associated with higher diagnostic yield for relevant lesions than UGI endoscopies without an appropriate indication, so preventing unnecessary discomfort and harm
Construct	**Denominator**: All UGI endoscopies **Numerator**: UGI endoscopies with an explicit appropriate indication **Exclusions**: None
Standards	Minimum standard: ≥ 90 % Target standard: ≥ 95 %
Consensus agreement	First round: 100 % Second round: 100 %
PICO number	1
Evidence grading	Very low quality

The acceptance of this performance measure is based on agreement with the following statement:

- Patients referred for a UGI endoscopy should have an appropriate indication. Agreement: 100 % (first round), 100 % (second round)
  Each proposed indication was voted on individually. Agreement for each: 81.5 %–100 %

UGI endoscopy is the gold-standard diagnostic examination for UGI diseases involving the esophagus, the stomach, and the proximal duodenum, allowing a direct and excellent view of the mucosal surfaces. It is a minimally invasive procedure, with very rare complications in purely diagnostic situations, that is tolerated by many patients without any sedation, and allows endoscopic diagnosis of most diseases, complemented if necessary with the performance of biopsies for pathological diagnosis. Its correct use as a diagnostic or screening examination is dependent on its performance on patients with a proper indication based on broad clinical consensus, higher diagnostic yields of clinically relevant findings, decades of procedures performed worldwide, and the balance between benefits and harms for the patient [4–15].

Overuse of UGI endoscopy seems however to be emerging, and up to 58 % of examinations may now be performed for inappropriate indications [16]. The performance of a UGI endoscopy without a proper indication exposes patients to potential unnecessary risks and adverse events (AEs), with subsequent patient and endoscopist dissatisfaction. In addition, it causes a significant overload on endoscopy departments, resulting in inefficiency at work, longer waiting times, and delayed diagnosis for correct procedures, greater and faster wear of the endoscopic equipment, and increased costs and footprint of the endoscopic activity [9, 17]. As such, if a procedure is performed for a reason outside of a consensus list of indications, a clear justification for the procedure should be documented.

UGI endoscopy as a screening procedure may be appropriate for selected populations. Screening of gastric cancer and/or gastric precancerous conditions may be appropriate in high risk regions every 2–3 years, or every 5 years in intermediate risk regions, if cost-effectiveness has been proven [11]. Barrett's esophagus (BE) screening might be appropriate in selected populations, such as patients aged ≥ 50 years with symptoms of chronic gastroesophageal reflux disease and at least one of the following: white ethnicity, male sex, obesity, smoking, or a first-degree relative with BE or esophageal adenocarcinoma [5]. Esophageal cancer screening may be appropriate in selected patients with previous head and neck squamous cell carcinoma (SCC) that has been curably treated, based on risk and life-expectancy [18].

Beyond endoscopic diagnostic exploration, therapy has emerged as a relevant part of the UGI endoscopic activity. If necessary, UGI endoscopic therapy should in most cases achieve hemostasis or resection of lesions, allow luminal patency or enteral feeding, and resolve complications [6, 8, 9, 15, 19–25]. Finally, preoperative UGI endoscopy can identify anatomical modifications, asymptomatic pathologies, and precancerous conditions, which might be relevant to detect before scheduling a UGI surgery. ▶ **Table 2** shows the indications for UGI endoscopy based on broad clinical consensus.

In conclusion, performing a UGI endoscopy with an appropriate indication is the first and main step to obtaining the best result from the procedure, fulfilling both the patient's and doctor's expectations, and minimizing unintended risks or harms.

Key performance measure	Fasting instructions
Description	Percentage of patients receiving proper instructions for fasting prior to UGI endoscopy
Domain	Pre-procedure
Category	Process
Rationale	Patient safety and comfort, and UGI endoscopy diagnostic efficacy depend on adequate UGI tract visibility without luminal content, to achieve adequate visibility, allow inspection of the whole mucosa, reduce the risk of missed lesions or aspiration, and improve patients' comfort
Construct	**Denominator**: All diagnostic UGI endoscopies (note: patients whose UGI endoscopies are postponed because of lack of proper instructions should also be included in the calculation of the denominator) **Numerator**: Procedures in the denominator for which patients received proper instructions for fasting (≥ 2 hours for liquids and ≥ 6 hours for solids) **Exclusions**: Emergency procedures
Standards	Minimum standard: ≥ 90 % Target standard: ≥ 95 %
Consensus agreement	First round: 96.6 % Second round: 96.0 %
PICO number	2
Evidence grading	Low quality

A previous single statement did not reach consensus (agreement: 70.3 %). The acceptance of this performance measure is based on agreement with the following updated statement:

- Patients referred for a UGI endoscopy should be fasting for ≥ 2 hours for liquids and ≥ 6 hours for solids. Agreement: 96.6 % (first round), 96.0 % (second round)

Adequate preparation for a UGI endoscopy is fundamental in terms of safety but also regarding adequate visibility for detection of lesions. Usually, safety depends on the absence of relevant fluids or solids that can reflux and cause aspiration, while adequate visibility is more demanding, requiring perfect mucosal visibility to allow adequate detection of lesions.

Regarding safety, no new evidence regarding fasting for solids or liquids for the general population was published in recent years, and the recommendation for fasting remains the same as in the previous publication, with a recommended fasting time for liquids of ≥ 2 hours and for solids of ≥ 6 hours [1]. These fasting intervals reportedly allow good gastric mucosal

▶ **Table 2** Indications for upper gastrointestinal (UGI) endoscopy.

Indication	References
Diagnostic indications	
Upper abdominal symptoms that persist despite an appropriate therapy (persistent gastroesophageal reflux, odynophagia, or dyspepsia unresponsive to 6 weeks treatment in primary care)	[10, 12]
Upper abdominal symptoms associated with other symptoms or signs suggesting structural disease (e. g. anorexia, dysphagia, or weight loss) or new-onset symptoms in patients > 50 years of age	[10]
Persistent vomiting or recurrent nausea of unknown origin	[10]
Gastrointestinal bleeding (active or recent) as suspected chronic blood loss, or iron deficiency anemia if the clinical situation suggests a UGI source of bleeding or colonoscopy is negative	[8, 10]
Diseases in which the presence of UGI involvement or pathology might modify the management (e. g. ulcer or UGI bleeding in patients scheduled for organ transplantation, anticoagulation or nonsteroidal anti-inflammatory drug therapy for arthritis, head and neck cancer, Crohn's disease)	[10]
Need for biopsy and/or fluid sampling (diagnosis/surveillance of eosinophilic esophagitis, BE, esophageal or gastric ulcers, esophageal or gastric early neoplasia, staging of gastritis, celiac disease, Crohn's disease, other enteropathies)	[5, 7, 10, 13]
Suspected portal hypertension to document or treat esophageal varices and/or congestive gastropathy	[6, 10]
Definition of acute and chronic caustic injury	[10, 14]
Evaluation prior to bariatric treatment	[10, 15]
Surveillance in subjects with precancerous conditions (BE, chronic atrophic gastritis with intestinal metaplasia with/without dysplasia, polyposis syndromes, gastric adenomas, tylosis, previous caustic ingestion, family history of gastric carcinoma, high risk populations)	[5, 10, 11]
Screening for gastric cancer or gastric precancerous conditions, BE, or esophageal cancer, in selected populations	[5, 11, 18]
Familial adenomatous polyposis syndromes and other genetic syndromes with UGI tract involvement	[10]
Radiologically abnormal or suspicious findings requiring confirmation and specific histological diagnosis (suspected neoplastic lesion, gastric or esophageal ulcer, stricture, or obstruction), or selected cases of metastatic carcinoma of unknown origin	[10]
Intraoperative assessment (evaluation of anastomotic leak and patency, fundoplication formation, pouch configuration)	[10]
Therapeutic indications	
Resection of early neoplastic lesions	[4, 10, 19, 20]
Coagulation (heater probe, argon plasma, laser), banding, or injection therapy for bleeding lesions (ulcers, tumors, vascular abnormalities, varices)	[4, 6, 8, 10]
Removal of foreign bodies	[10, 25]
Placement of feeding or drainage tubes (percutaneous endoscopic gastrostomy or jejunostomy, nasogastric tube)	[10, 22]
Dilation or stenting of benign/malignant stenosis (transendoscopic balloon dilation, over-the-wire or through-the-scope stenting, coagulation, incision)	[10, 21]
Treatment of Zenker's diverticulum, achalasia, or gastroparesis	[9, 10]
Management of complications after diagnostic or therapeutic endoscopy or UGI surgery	[10, 23]

BE, Barrett's esophagus.

visibility, no aspiration, and lower discomfort scores compared with longer fasting intervals [1].

Some concerns are emerging regarding patients prescribed glucagon-like peptide-1 receptor agonists, owing to delayed gastric emptying, but randomized trials with diagnostic accuracy and safety as major outcomes are lacking [26]. A new proposal for a 4-hour fasting period for semifluids was addressed in a single trial, but the message for patients regarding the difference between solids, semifluids, and liquids may not be clear. Also, the procedures were performed with the patients unsedated, and anesthesiologists' agreement has not been given for its widespread clinical applicability [27].

Minor performance measure	Time slot for upper gastrointestinal endoscopy
Description	The time slot allocated for a diagnostic UGI endoscopy
Domain	Pre-procedure
Category	Process
Rationale	Any diagnostic UGI endoscopy needs an adequate time allocated for the entire procedure, including discussion with the patient, sedation if applicable, performance of the endoscopic procedure, writing of the endoscopy report and pathology request if applicable, and preparation of the room for the next patient Time pressure due to inadequate/shorter time slots may impair the quality of the endoscopic procedure
Construct	**Denominator**: All diagnostic UGI endoscopies **Numerator**: Diagnostic UGI endoscopies scheduled with a minimum time slot of 20 minutes **Exclusions**: Therapeutic procedures, emergency procedures, procedures with a specific diagnostic purpose without the need for a full evaluation
Standards	Minimum standard: ≥ 90 % Target standard: ≥ 95 %
Consensus agreement	First round: 82.1 % Second round: 96.0 %
PICO number	3
Evidence grading	Very low quality

The acceptance of this performance measure is based on agreement with the following statement:

- Patients scheduled for a diagnostic UGI endoscopy should have an allocated time slot of ≥ 20 minutes. Agreement: 82.1 % (first round), 96.0 % (second round)

The time slot allocated to perform a diagnostic UGI endoscopy should be enough to comply with all quality performance measures, without any rush, considering the time from the patient entering the endoscopy room until the time for the next patient to enter the same room. This "endoscopy room time" needs to take into account the discussion with the patient regarding informed consent and clarification of any last minute doubt, the sedation induction (including pre-sedation checklist) if applicable, the endoscopic examination time itself, the performance of biopsies if applicable, the writing of the endoscopy report and pathology request if applicable, the explanation of results to the patient, and the cleaning of the endoscopy room, until available for the next patient.

There is a general paucity of literature regarding the accounting of this "endoscopy room time," even for general diagnostic procedures. There are some studies reporting on the examination time (see further information under "Examination time" in Domain 3: Identification of pathology) and recovery time (usually done in a recovery room and not in the endoscopy room), but these are not the "endoscopy room time," which is the relevant time for the definition of an adequate allocated time slot.

A few Societies have proposed an allocated time slot for a diagnostic UGI endoscopy, mainly based on the time proposed for the performance of the endoscopic procedures themselves, plus some more minutes to accommodate all the other issues mentioned regarding the pre-procedure and post-procedure phases.

The British recommendation, in 2017, suggested a minimum of 20 minutes be allocated for a standard diagnostic UGI endoscopy, increasing as appropriate for surveillance of high risk conditions [28]. The Spanish recommendation, in 2020, in the context of the resumption of endoscopic activity after the peak phase of the COVID-19 pandemic, proposed 30 minutes when scheduling a diagnostic UGI endoscopy, assuming that the disinfection/preparation of the endoscopy rooms was much longer than before the pandemic [29]. The Italian recommendation, in 2022, proposed a total time of 30 minutes per diagnostic UGI endoscopy, divided into a fixed time of 20 minutes, and an additional time of 10 minutes in case biopsies needed to be performed [30]. Other Societies recommend a minimum procedure time for performing a diagnostic UGI endoscopy, or just report that a longer inspection improves detection of lesions, but without any proposal regarding an allocated time slot [10, 31–33].

The group debated about the time needed to perform all the proposed quality performance measures in the present manuscript and concluded that, for most cases in daily life, an allocated time slot of 20 minutes would be enough for a diagnostic UGI endoscopy. This allocated time slot should be feasible in general (balancing quality performance standards without increasing waiting lists), is intended for routine diagnostic procedures (not certain specific surveillance or therapeutic UGI endoscopies), and seems adequate compared with the proposed minimum of 30 minutes for a routine colonoscopy (also including all the issues before, during, and after procedures, including therapy) [34].

The minimum 20-minute time slot would allow for 7–10 minutes for the UGI endoscopy procedure itself, and 10–13 minutes to perform all of the other issues that surround an endoscopic examination, and should be feasible, especially if the endoscopy service adheres to several practices to facilitate the patient pathway through the endoscopy service from attendance to departure, namely speeding up administrative issues like admittance, and informed consent/safety checklist verification, having an adequately staffed preparation/recovery room with dedicated personnel for patients' reception, preparation, and intravenous cannulation for those requiring sedation, use of endoscopy reporting systems that facilitate data entry and collection of quality parameters, and simplified complete post-procedure recovery, yet still allowing for adequate patient information and discharge [35–37].

In a patient scheduled for a double consecutive endoscopic examination with a UGI endoscopy and a colonoscopy in the same session, a 5-minute reduction in the overall time slot is conceivable.

In conclusion, patients scheduled for a diagnostic UGI endoscopy should have an allocated time slot of ≥ 20 minutes. This time should be different for some surveillance UGI endoscopies, namely for patients with extensive gastritis (≥ 30 minutes) or BE (≥ 30 minutes, increasing to 40 minutes for ultra-long segments) [5].

2 Domain: Completeness of procedure

Key performance measure	Visibility score
Description	Percentage of endoscopy reports that record the visibility of the mucosa by a validated score
Domain	Completeness of procedure
Category	Process
Rationale	UGI endoscopy quality depends on the detection of mucosal lesions. Proper visibility allows inspection of the entire mucosa of all segments of the UGI tract, a detailed inspection with chromoendoscopy for suspicious lesions, and decreases the rate of missed lesions
Construct	**Denominator**: All diagnostic UGI endoscopies **Numerator**: Procedures in the denominator with mucosal visibility scored according to one of the available validated scales: ▪ GRACE scale (Gastroscopy Rate of Cleanliness Evaluation) ▪ PEACE scale (Polprep Effective Assessment of Cleanliness in Esophagogastroduodenoscopy) ▪ Barcelona cleanliness scale **Exclusions**: Therapeutic procedures, emergency procedures, procedures with a specific diagnostic purpose without the need for a full evaluation, early termination of a procedure owing to patient intolerance or for reasons of safety, or alteration of the normal anatomy due to previous surgical resection or bariatric surgery
Standards	Minimum standard: ≥ 90 % Target standard: ≥ 95 %
Consensus agreement	Statement 1: First round: 88.9 %, Second round: 89.7 % Statement 2: First round: 89.7 %, Second round: 92.0 %
PICO numbers	4 and 5
Evidence grading	Low quality

The acceptance of this performance measure is based on agreement with the following statements:

- Adequate reporting for a diagnostic UGI should include a mucosal visibility score according to one of the available standardized and validated scales. Agreement: 88.9 % (first round), 89.7 % (second round)

A previous statement did not reach consensus (agreement: 70.3 %). The updated statement is:

- To achieve adequate cleanliness, patients should receive simethicone or a similar antifoaming agent as a premedication 30 minutes before a UGI endoscopy. If foam, bubbles, or biliary fluids still impair the visibility of the mucosa, water or simethicone should be used during the procedure via the working channel. Agreement: 89.7 % (first round), 92.0 % (second round)

Adequate visibility during a UGI endoscopy is fundamental for the adequate detection and diagnosis of lesions, and improves communication among endoscopists, but no validated scale was available at the time of the previous publication [1]. In recent years, several research groups have developed scales assessing the cleanliness of the UGI tract. The main rationale was the existing scales for lower GI endoscopy that are key performance measures, which highlight the importance of proper visualization on lesion detection, and allow a standardized use of terminology to describe mucosal visibility [34]. Historically, several scales for UGI visibility have been constructed to assess the effectiveness of preparation agents in terms of visibility or to assess visibility during emergency UGI endoscopy, but have lacked a full validation process or provide only moderate interobserver agreement with kappa values of 0.58–0.73 [38–44]. In the last few years, five scales have been created and better validated.

The Crema scale or Crema Stomach Cleaning Score (CSCS) scale scores gastric mucosal visibility in three sections (fundus, corpus, and antrum), each with three grades, ranging from 1 to 3 (1 poor preparation needing extensive washing; 3 clean mucosa) [45]. The scale was validated in a single round by four endoscopists in 20 videos and resulted in a kappa value of 0.91. The main limitation of this score is that it only measures visibility in the stomach, and it had a limited validation process.

The Toronto scale or Toronto Upper Gastrointestinal Cleaning Score (TUGCS) assesses four segments (gastric fundus, corpus and antrum, and duodenum) with four grades, ranging from 0 to 3 (0 poor visibility; 3 excellent visibility). The study consisted of 55 live case assessments and two rounds of assessment of 12 videos by 13 worldwide expert endoscopists, preceded by a Delphi process. The intraclass correlation coefficient was 0.79 for interobserver reliability and 0.83 for test–retest reliability. Its main limitation is that the scale does not measure visibility in the esophagus [46].

The Barcelona scale assesses five segments (esophagus, gastric fundus, corpus and antrum, and duodenum) with three grades, ranging from 0 to 2 (0 poor visibility; 2 excellent visibility). The scale was validated based on the assessment of 100 photos by 15 endoscopists from 13 Spanish centers [47]. The inter- and intraobserver agreements provided kappa values of 0.83 and 0.89, respectively.

The PEACE scale or Polprep Effective Assessment of Cleanliness in Esophagogastroduodenoscopy was constructed similarly to the Boston Bowel Preparation Scale, assessing three segments (esophagus, stomach, and duodenum) with four grades, ranging from 0 to 3 (0 poor visibility; 3 excellent visibility), after cleaning. The retrospective validation of 18 photos by 12 endoscopists showed good interobserver agreement, with an intraclass correlation coefficient of 0.8, and good intraobserver agreement, with a kappa of 0.64 [48]. Also, segments scored as 3 tended to have a higher pathology detection rate than those

scored 1 (odds ratio [OR] 3.2, 95 %CI 1.1 to 9.0; $P = 0.03$). In a further prospective validation with 995 patients from five centers mainly in Poland, adequate cleanliness, defined as scores of ≥ 2 for esophagus, stomach, and duodenum, was an independent factor for UGI pathology detection (OR 1.78, 95 %CI 1.06 to 3.01; $P = 0.03$) and number of segments with lesions (OR 2.38, 95 %CI 1.17 to 4.82; $P = 0.02$) [49]. The next step was external reliability assessment of videos by a group of international experts. This showed good agreement, with intraclass correlation coefficient of 0.82 (95 %CI 0.75 to 0.89) [50]. The agreement was comparable between endoscopists from Asia and Oceania (0.86, 95 %CI 0.79 to 0.92) and Western ones (0.80, 95 %CI 0.72 to 0.88).

The Gastroscopy Rate of Cleanliness Evaluation (GRACE) scale was designed similarly to the Boston Bowel Preparation Scale and the PEACE scale, assessing three segments (esophagus, stomach, and duodenum) with four grades, ranging from 0 to 3 (0 poor visibility; 3 excellent visibility), after cleaning. It has gone through a three-stage, prospective, complete validation process, including a first phase with 60 photos assessed by four expert endoscopists twice, a second phase with the same 60 images scored twice by 54 experts and nonexperts worldwide, and a final third phase with real-time scale use in consecutive patients in each center [51]. It provided an interobserver agreement of 0.81 (95 %CI 0.73 to 0.87) in the first phase, and 0.80 (95 %CI 0.72 to 0.86) in the second phase; a reliability of 0.73 (95 %CI 0.63 to 0.82) in the first phase and 0.72 (95 %CI 0.63 to 0.81) in the second phase. In the real-time evaluation phase, the overall percentage of correct classifications was 80 % (95 %CI 77 % to 82 %).

A relevant topic related to visibility is how to achieve the better scores, and whether fasting is enough to achieve adequate UGI tract visibility. Since the last publication, multiple randomized controlled trials (RCTs) and some meta-analyses have been published comparing different UGI preparation agents to further enhance visibility beyond fasting. The main rationale for the search for improved visibility results from the fact that in randomized trials it was possible to move from rates of excellent visibility of around 70 % in the esophagus and duodenum to 85 % and 90 %, respectively and, most significantly, from 39 % to 76 % in the stomach, by adding simethicone or similar agents to fasting alone [41].

The most commonly used agent was simethicone, which is an antifoaming agent, used interchangeably with dimethicone [43]. Other agents used included mucolytic agents such as N-acetylcysteine and pronase [44]. The use of antifoaming agents as a regular UGI preparation has been recommended in Japanese, Australian, and British guidelines [28, 52, 53].

In a meta-analysis published in 2021, the use of preparation agents resulted in better visibility scores in comparison with no preparation (−2.69, 95 %CI −3.50 to −1.88; $P < 0.01$; $I^2 = 93$ %), while simethicone premedication specifically resulted in better visibility scores compared with no preparation (−2.68, 95 %CI −4.94 to −0.43; $P < 0.02$; $I^2 = 96$ %) [44]. All recently published RCTs not included in the previous meta-analyses also reported better visibility when simethicone premedication was used [45, 54–61]. Nevertheless, it is important to realize that assessment of visibility scores used in the presented studies was not standardized owing to the lack of a validated visibility scale.

The effectiveness of simethicone preparation is related to the dose and timing of administration. A dose of 133 mg resulted in better visibility compared with doses of ≤ 100 mg [44]. The estimated impact of preparation agents on visibility tended to be higher if administrated > 20 minutes before UGI endoscopy than only 0–10 minutes before [44]. In one study, simethicone administered between 31 and 60 minutes prior resulted in better visibility in the stomach than regimens with shorter times [62]. In another study, the best visibility was observed when simethicone was administrated 20–30 minutes before examination [63]. No meta-analysis has been performed regarding the dose and timing of administration, and we need to take into consideration that assessment of visibility used in the presented studies was not standardized.

The combination of simethicone as a antifoaming agent with other agents, such as mucolytic agents, like N-acetylcysteine or pronase, sodium bicarbonate, and peppermint oil, was also investigated [42–44, 55, 56, 58, 60, 61, 64–66]. Regarding visibility scores, the combination of simethicone and N-acetylcysteine was better than no preparation in both meta-analyses (−2.48, 95 %CI −4.45 to −0.51; $P < 0.01$; $I^2 = 96$ %; and −2.83, 95 %CI −4.38 to −1.27; $P < 0.01$), but pooled effectiveness on visibility improvement tended to be similar between simethicone, simethicone plus N-acetylcysteine, and simethicone plus pronase, but without any direct comparison [42, 44]. The efficacy of combined premedication is also related to the dose of the agents as a dose of 20 mg of simethicone and 400 mg of N-acetylcysteine was not superior to no preparation [65].

Another rationale for improved visibility is to hopefully detect more lesions. In one meta-analysis, premedication with simethicone and N-acetylcysteine increased the detection of UGI lesions (risk ratio [RR] = 1.31, 95 %CI 1.12 to 1.53; $P < 0.01$) [43]. RCTs published more recently, assessing detection of lesions as a secondary outcome, have provided conflicting results: in three studies, more lesions such as dysplasia or early cancers were detected in the premedication group versus fasting alone, although the differences observed were not statistically significant as the studies were underpowered for that outcome, while in two other studies, there were no differences in the detection rates [60, 61, 64, 66, 67]. Finally, an outcome that might be relevant for unsedated patients is that premedication with simethicone and N-acetylcysteine resulted in a decrease in the time needed for cleaning the mucosa with no difference in the total UGI endoscopy time [45].

Regarding safety for the use of these premedication agents, no difference in AEs between simethicone preparation groups and controls was found in one meta-analysis (RR 0.4, 95 %CI 0.2 to 1.0; $P = 0.05$; $I^2 = 0$ %); in the other meta-analysis (13 studies; 11 086 patients), no cases of aspiration were reported [43, 44].

Regarding safety specifically among sedated patients, recent studies with patients receiving conscious sedation reported no AEs or were comparable between the prepared and non-prepared individuals [45, 56–59, 64]. In one study with 205 patients under propofol sedation (101 prepared; 104 controls), the median minimum oxygen saturation level was

98 % versus 100 %, and 0 % versus 4.6 % of patients had a saturation level <90 % [64]. In another study with 615 sedated patients, no differences in oxygen saturation were observed between prepared and control patients [67]. In three other studies including 496, 800, and 7200 patients who underwent UGI endoscopy with sedation, no serious AEs were reported regardless of premedication [60, 61, 66]. This may be related to there being comparable amounts of residual gastric fluid both in patients receiving premedication and those who did not [59, 65].

In conclusion, the published data support the safety of premedication for UGI endoscopy, even for patients under sedation, with better results using 133 mg of simethicone in 100 mL of water, 30–60 minutes before the procedure. Therefore, the use of premedication as part of the UGI endoscopy preparation protocol should be encouraged. Despite the evidence, owing to concerns regarding applicability and implementation issues, the group did not reach an agreement with regard to suggesting the use of simethicone as a preprocedure performance measure.

The group did however agree and propose the reporting of UGI tract visibility by one of the validated scales available, with visibility being a direct consequence of using simethicone as a premedication. Because all segments in a diagnostic UGI endoscopy are relevant, we propose the use of the GRACE scale, the PEACE scale, or the Barcelona scale when describing the final visibility of the UGI mucosa achieved after cleaning. Further studies are awaited to assess the need or not to achieve the highest scores for adequate lesion detection, and worldwide applicability and reliability agreements.

Key performance measure	Photodocumentation
Description	Percentage of UGI endoscopy reports with accurate photodocumentation of anatomical landmarks and all abnormal findings
Domain	Completeness of procedure
Category	Process
Rationale	Photodocumentation of all anatomical landmarks is an indicator of a complete examination. Accurate photodocumentation of abnormal findings allows for better communication and follow-up
Construct	Accurate photodocumentation includes at least one representative photo of each of the following 10 anatomical landmarks, taken in the following proposed sequence: proximal esophagus, distal esophagus, Z line and diaphragmatic indentation, duodenal bulb, second part of duodenum, antrum, cardia and fundus in full inversion, lesser curvature of corpus in partial inversion, incisura in partial inversion, and greater curvature of corpus in forward view **Denominator**: All diagnostic UGI endoscopies **Numerator**: Procedures in the denominator that contain accurate photodocumentation, as detailed above **Exclusions**: Therapeutic procedures, emergency procedures, procedures with a specific diagnostic purpose without the need for a full evaluation, early termination of procedure owing to patient intolerance or for reasons of safety, or alteration of the normal anatomy due to previous surgical resection or bariatric surgery
Standards	Minimum standard: ≥ 90 % Target standard: ≥ 95 %
Consensus agreement	First round: 96.3 % Second round: 100 %
PICO number	6
Evidence grading	Very low quality

The acceptance of this performance measure is based on agreement with the following statements:

- Adequate photodocumentation for a diagnostic UGI should include relevant normal anatomical landmarks and all abnormal findings. Agreement: 96.3 % (first round), 100 % (second round)

Two proposals regarding number of photos were voted on, the one from 2016 and a new 2024 proposal, without any clear preference: 48.1 % versus 51.9 %, respectively. Therefore, the group decided to maintain the previous proposal.

- **2016 proposal** 10 photos (proximal to distal): three in esophagus (proximal esophagus, distal esophagus, and Z line and diaphragmatic indentation), five in stomach (cardia and fundus, lesser curvature of corpus, greater curvature of corpus, incisura, and antrum), and two in duodenum (duodenal bulb and second part of duodenum).
- **New 2024 proposal** 16 photos (proximal to distal): proximal esophagus, distal esophagus including Z line, cardia, fundus, lesser curvature of corpus, greater curvature of corpus, anterior wall of corpus, posterior wall of corpus, incisura, lesser curvature of antrum, greater curvature of antrum, anterior wall of antrum, posterior wall of antrum, pylorus, duodenal bulb, and second part of duodenum.

Photodocumentation is a fundamental aspect for endoscopists to perform quality examinations, providing further support of the description in the text report. Most of the endoscopic equipment and reporting software currently available allows high quality digital photos to be obtained, usually in a simple and friendly manner that does not demand much time or effort during the endoscopic procedure. In addition, adequate photodocumentation can be an indirect indicator of an exhaustive and detailed inspection of the esophageal, gastric, and duodenal mucosa, and of complete examination [35].

To obtain the maximum possible sharpness, it is recommended to freeze the image before saving the photo. In addition, it would be convenient for each endoscopist to establish a systematic routine for photo acquisition, in order to not forget to capture all the recommended landmark photos.

There is no clear consensus or evidence on the number or locations of photos that should be taken in a UGI endoscopy, but most authors do agree that any lesion or abnormal finding should be documented with a photo [28, 68]. The greatest discrepancies are however related to the anatomical landmarks that are proposed to be captured in a photo, differences in criteria that could be related to the wide differences across settings with regard to the incidence of BE or gastric cancer [69].

In 2016, in the previous version of these performance measures for UGI endoscopy, we proposed taking at least 10 photos for any diagnostic UGI endoscopy (proximal to distal): (i) proximal esophagus, (ii) distal esophagus, (iii) Z line and diaphragmatic indentation, (iv) cardia and fundus, (v) lesser curvature of corpus, (vi) greater curvature of corpus, (vii) incisura, (viii) antrum, (ix) duodenal bulb, and (x) second part of duodenum [1].

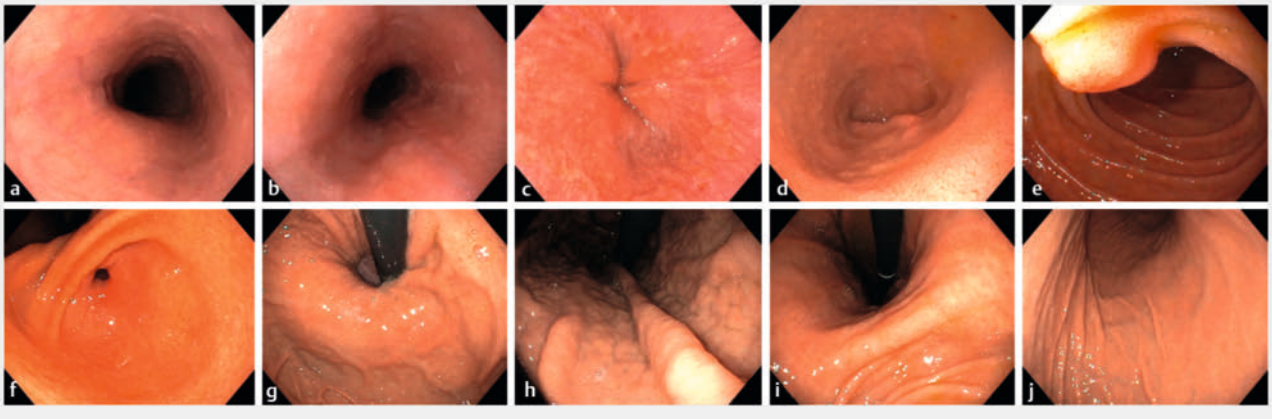
In 2017, the British Society of Gastroenterology and the Association of UGI Surgeons of Great Britain and Ireland stated that photodocumentation should be made of relevant anatomical landmarks and any detected lesions, but without a formal recommendation of the number and location of photos [28]. In 2018, the Korean Society of Gastrointestinal Endoscopy recommended taking only eight photos [68]. In 2020, the World Endoscopy Organization recommended taking at least 28 photos, including one of the hypopharynx, four of the esophagus, 21 of the stomach, and two of the duodenum [70]. In 2025, the American Society for Gastrointestinal Endoscopy and the American College of Gastroenterology proposed a set of just seven photos [10].

In very specific settings, but not for every diagnostic UGI endoscopy, more detailed photodocumentation might be desirable, such as for surveillance of BE (one photo of every 1–2 cm of Barrett's) or surveillance of high risk patients for gastric cancer (22 photos of the stomach) [5, 71].

Our group considered increasing the number of recommended photos, balancing feasibility, time spent, and lack of clear evidence beyond expert opinions, as any substantial increase in the number of photos might not be feasible for all examinations, and is not proven to increase diagnostic yield by itself (unlike increased time for inspection). After voting, no clear majority nor consensus to increase the number of photos to be taken was reached, and most comments were that striking a balance between comprehensive photodocumentation and practical feasibility was crucial.

As a result, it was decided to maintain the previously given recommendation of a minimum of 10 photos to be taken of the same landmarks for any normal diagnostic UGI endoscopy, plus a photo of any lesion or abnormal finding.

It is recommended to take photos of the esophagus and duodenum during insertion to avoid lesions caused by endoscope friction, especially in the cardia and duodenal bulb, and photos of the stomach during withdrawal. As such, the following sequence could be adopted as a proposal to systematically record the 10 photos, allowing correct landmark identification and examination time measurement: (i) proximal esophagus, (ii) distal esophagus, (iii) Z line and diaphragmatic indentation, (iv) duodenal bulb, (v) second part of duodenum, (vi) antrum, (vii) cardia and fundus in full inversion, (viii) lesser curvature of corpus in partial inversion, (ix) incisura in partial inversion, (x) greater curvature of corpus in forward view (▶ **Fig. 2**). When



▶ **Fig. 2** The proposed sequence for the 10 recommended photos that should be captured during any diagnostic upper gastrointestinal endoscopy is: **a** photo #1, proximal esophagus; **b** photo #2, distal esophagus; **c** photo #3, Z line and diaphragmatic indentation; **d** photo #4, duodenal bulb; **e** photo #5, second part of duodenum; **f** photo #6, antrum; **g** photo #7, cardia and fundus in full inversion; **h** photo #8, lesser curvature of corpus in partial inversion; **i** photo #9, incisura in partial inversion; **j** photo #10, greater curvature of corpus in forward view.

withdrawing from the esophagus, a repeated final photo of the upper esophagus just below the sphincter would allow calculation of the examination time.

The Working Group would like to emphasize that an endoscopy report without photodocumentation is no longer acceptable in 2025. All modern endoscopy systems are fully equipped for digital photodocumentation and lack of digital storage capacity cannot be used as an excuse. Similarly to a radiological examination, photos constitute an intrinsic and invaluable part of the examination. Freezing the image prior to capturing the photo allows the endoscopist to focus on findings and will increase inspection time because it also documents the cleanliness of the UGI tract. In addition, it allows reassessment of findings and also serves as a medicolegal protection should questions be raised about the quality of the endoscopy (e.g. interval cancers).

A proposal for reporting a UGI endoscopy with the minimum information that should be included, to unify, structure, and standardize the endoscopy report, is available [72].

3 Domain: Identification of pathology

Key performance measure	Examination time
Description	Percentage of UGI endoscopies lasting ≥ 7 minutes from intubation to extubation
Domain	Identification of pathology
Category	Process
Rationale	Longer inspection times allow the detection of more lesions in the esophagus, stomach, and duodenum
Construct	Record time from intubation to extubation of the endoscope **Denominator**: All diagnostic UGI endoscopies **Numerator**: Procedures in the denominator with the duration of the procedure documented as being ≥ 7 minutes from intubation to extubation (note: procedures without a recorded time should be regarded as fails) **Exclusions**: Therapeutic procedures, emergency procedures, procedures with a specific diagnostic purpose without the need for a full evaluation, early termination of procedure owing to patient intolerance or for reasons of safety, or alteration of the normal anatomy due to previous surgical resection or bariatric surgery
Standards	Minimum standard: ≥ 90 % Target standard: ≥ 95 %
Consensus agreement	First round: 96.3 % Second round: 100 %
PICO number	7
Evidence grading	Low quality

The acceptance of this performance measure is based on agreement with the following statement:

- Adequate inspection for a diagnostic UGI should include the esophagus, stomach, and duodenum, and should last ≥ 7 minutes from intubation to extubation. Agreement: 96.3 % (first round), 100 % (second round)

At the time of the previous publication in 2016, only one retrospective study assessing the inspection time of a UGI endoscopy was available, concluding that endoscopists taking ≥ 7 minutes on average to perform a normal endoscopy from intubation to extubation detected three times more cases of dysplasia or cancer (OR 3.42, 95 %CI 1.25 to 10.38) than endoscopists taking < 7 minutes [73].

Since then, several studies have evaluated the procedure time of a diagnostic UGI endoscopy as a measure to improve the diagnostic yield. Most studies are retrospective [74–83] and show heterogeneity in the procedure time measurement: four studies assessed the examination time, defined as the time from the first photo of the upper esophagus until the last photo of the upper esophagus (from intubation to extubation) [74–77]; four studies assessed the withdrawal time, defined as the time from the first photo of the second portion of the duodenum until the last photo of the upper esophagus [78–81]; and two studies assessed gastric observation time, defined as the time between the first and the last photo of the stomach, after the withdrawal from the duodenum [82, 83].

Regarding the four studies assessing examination time from intubation to extubation: in a retrospective study with 15 763 patients, endoscopists who had a mean examination time without biopsy of 5–7 minutes diagnosed more neoplastic lesions than those with a time of < 5 minutes (0.97 % vs. 0.57 %; OR 1.90, 95 %CI 1.06 to 3.40; $P = 0.03$), but a longer mean time above 7 minutes narrowly failed to reach significance (0.94 % vs. 0.57 %; OR 1.89, 95 %CI 0.98 to 3.64; $P = 0.06$) [74]. Another retrospective study with 3925 patients, comparing examination times of < 7, 7–10, and > 10 minutes, failed to find any significant result, with UGI neoplasm detection rates of 3.6 %, 3.3 %, and 3.1 %, respectively ($P = 0.81$) [75]. In a prospective multicenter study analyzing 847 and 1079 UGI endoscopies before and after implementation of ≥ 6 minutes, without biopsy, as an institutional policy, a higher rate of detection of high risk lesions (combining advanced atrophic gastritis and neoplastic lesions) was achieved (OR 1.65, 95 %CI 1.04 to 2.64; $P = 0.04$) [76]. Finally, in a prospective study assessing the examination time from intubation to extubation, but irrespective of biopsies, in 880 UGI diagnostic endoscopies, examinations with a duration > 4.2 minutes were related to higher lesion detection (1.8 % vs. 0 %; $P = 0.01$) [77].

Regarding the four studies assessing withdrawal time from duodenum to extubation: in a retrospective study with 120 871 patients, endoscopists with a withdrawal time without biopsy of ≥ 3 minutes diagnosed more neoplastic lesions (0.28 % vs. 0.20 %; $P = 0.01$), especially for early lesions [78]. When the same group prospectively evaluated implementation of the institutional policy of the withdrawal time in 30 506 asymptomatic patients, UGI endoscopies with ≥ 3 minutes of withdrawal resulted in higher lesion detection (OR 1.51, 95 %CI 1.21 to 1.90) [79]. This result was further confirmed in another retro-

spective study from the same group in 67 683 patients, showing a higher gastric neoplasm detection rate within UGI endoscopies lasting > 2.5 minutes (OR 1.49, 95 %CI 1.09 to 2.04; P = 0.01) [80]. Finally, in another retrospective study, analyzing 95 missed gastric adenomas, defined as gastric adenomas diagnosed within 3 years of a negative screening UGI endoscopy, shorter withdrawal time was associated with increased risk of a missed gastric adenoma (β = −0.01; OR 0.99, 95 %CI 0.98 to 0.99; P < 0.01), with an average time of 3 minutes for the index endoscopy and 4.4 minutes for the diagnostic endoscopy, and an optimal cutoff of 3.5 minutes for adenoma detection [81].

Regarding the two studies assessing gastric examination time, in a retrospective study analyzing 1257 interval gastric cancers diagnosed within 6–36 months of a "normal" UGI endoscopy, a gastric observation time < 3 minutes was associated with higher risk of interval gastric cancer (OR 2.27, 95 %CI 1.20 to 4.30) [83]. In another retrospective study with 13 477 patients, the gastric examination time was an independent predictor for detecting gastric neoplasms or lymphomas in *Helicobacter pylori*-eradicated patients [82].

Despite this heterogeneity of inspection time measurement, the procedure time for any diagnostic UGI endoscopy should be easily measured, by simply calculating the difference in time between two photos. Setting the perfect calculation and threshold is difficult as different definitions were used and most, but not all, studies calculated the time without biopsies; this aspect seems to be relevant as the biopsy rate could be high in certain settings owing to the Management of precancerous conditions and lesions in the stomach (MAPS) protocol [11].

It is worthwhile mentioning that sedation might be needed to achieve a complete examination, allow a detailed inspection, and fulfil all of the quality parameters associated with a UGI endoscopic procedure, also providing better comfort and tolerance for the patient, although this is an area lacking relevant randomized trials [84, 85].

In conclusion, the proposed 7-minute examination time threshold for a full UGI diagnostic endoscopic procedure, from intubation to extubation, is at present the one with more supporting evidence from different settings, covering both the 5- and 6-minute thresholds, based on the mean time without biopsies, with an eventual extra time spend for biopsies if needed, and allowing ≥ 3 minutes to be spent just for gastric inspection. In the near future, randomized or comparative prospective studies would be welcome, to better define the best metric and threshold, the need for sedation, and also to assess patient comfort and experience during UGI endoscopy.

Key performance measure	Standardized terminology
Description	Percentage of UGI endoscopy reports with accurate application of standardized disease-related terminology
Domain	Identification of pathology
Category	Process
Rationale	Appropriate application of standardized disease-related terminology allows for uniformity in communication. The severity of a specific pathology according to a validated classification allows physicians to optimize the patient's treatment
Construct	Record the use of the following classification, when applicable: ▪ Los Angeles classification for erosive esophagitis ▪ Prague classification for Barrett's esophagus ▪ Forrest classification for bleeding ulcers ▪ Paris classification for visible lesions ▪ Baveno classification for varices ▪ Zargar classification for caustic lesions ▪ Spigelman classification for duodenal adenomas in patients with familial adenomatous polyposis **Denominator**: All UGI endoscopies addressing one or more of the above groups of pathologies **Numerator**: Procedures in the denominator where the report includes the appropriate use of all disease-related terminology. The performance measure is only met when all applicable disease-related terminology is used in a report so, for instance, in a patient with esophagitis and Barrett's esophagus, both the Los Angeles and Prague classifications should be used **Exclusions**: None The following classifications are useful and clinically applicable; however, they are not considered for the calculation of this performance measure: ▪ Endoscopic Reference Score for eosinophilic esophagitis ▪ Kodsi's classification for candida esophagitis ▪ Hill's classification for the assessment of gastroesophageal flap valve ▪ Kimura–Takemoto classification for grading extension of gastric atrophy ▪ Endoscopic Grading for Gastric Intestinal Metaplasia (EGGIM) classification for grading severity and extension of intestinal metaplasia
Standards	Minimum standard: ≥ 90 % Target standard: ≥ 95 %
Consensus agreement	First round: 100 % Second round: 100 %
PICO number	8
Evidence grading	Very low quality

The acceptance of this performance measure is based on agreement with the following statement:

- Adequate terminology for a diagnostic UGI should include the description of any abnormal finding according to the available standardized and validated classification systems. Agreement: 100 % (first round), 100 % (second round)

Each of the proposed classifications was voted on individually.

The use of validated classifications improves communication among physicians and most of them help guide the patient's treatment. Specifically in Barrett's reporting, it has been shown that systematic reporting of the landmarks and the Prague classification in itself increased neoplasia detection [86]. In the previous publication and this updated consensus, an agreement of 100 % was reached regarding the use of available standardized and validated classifications when describing abnormal findings [1]. In this updated version, the consensus was confirmed for five of the following classifications: Los Angeles classification for erosive esophagitis [87] (100 % agreement); Prague classification for BE [88] (100 % agreement); Forrest classification for bleeding ulcers [89] (100 % agreement); Paris classification for visible lesions [90] (96.3 % agreement); and Baveno classification for varices [91, 92] (96.3 % agreement). Although agreement was not reached for the Zargar classification for caustic lesions [93] (66.7 % agreement) and Spigelman classification for duodenal adenomas in patients with familial adenomatous polyposis [94] (77.8 % agreement), these two classifications, applicable in rare and very specific populations, are simple to apply and have an intrinsic clinical value in terms of a patient's management and follow-up.

Other existing classifications were proposed during the voting; however, they did not achieve ≥ 80 % agreement for several reasons, mainly higher interobserver variability, difficult training, or their complexity. These included: the Endoscopic Reference Score for eosinophilic esophagitis [95, 96] (51.9 % agreement); Kodsi's classification for candida esophagitis [97] (14.8 % agreement); Hill's classification for assessment of gastroesophageal flap valve [98] (48.2 % agreement); the Kimura–Takemoto classification for severity of gastric atrophy [99–102] (25.9 % agreement); and the Endoscopic Grading for Gastric Intestinal Metaplasia (EGGIM) classification [103–105] (48.2 % agreement).

In conclusion, as a quality performance measure, the group continues to propose measurement, when applicable, of the same seven endoscopic classifications previously proposed: Los Angeles classification for erosive esophagitis, Prague classification for BE, Forrest classification for bleeding ulcers, Paris classification for visible lesions, Baveno classification for varices, Zargar classification for caustic lesions, and Spigelman classification for duodenal adenomas in patients with familial adenomatous polyposis [1]. Other existing classifications might be used at the discretion of the endoscopist but would not be used for measuring quality at present (**Appendix 2 s**). New evidence regarding clinical relevance or agreement of existing scales, or even new scales, might change this proposal in future updates of this statement.

Minor performance measure	Observation time and chromoendoscopy in BE inspection
Description	Percentage of routine BE surveillance endoscopies lasting ≥ 1 minute of inspection time per cm of Barrett's epithelium and using chromoendoscopy
Domain	Identification of pathology

(Continuation)

Minor performance measure	Observation time and chromoendoscopy in BE inspection
Category	Process
Rationale	Longer inspection time allows better detection of lesions in BE
Construct	Record the Prague classification Record inspection time of the esophagus Calculate the inspection time expressed as minutes per circumferential extent of Barrett's epithelium in cm Record the use of chromoendoscopy (acetic acid and/or virtual) when inspecting BE to guide targeted biopsies **Denominator**: BE diagnostic surveillance UGI endoscopies **Numerator**: Procedures in the denominator with an inspection time of ≥ 1 minute per cm of Barrett's epithelium Procedures in the denominator that report the use of chromoendoscopy (acetic acid and/or virtual) **Exclusions**: Early termination of procedure owing to patient intolerance or for reasons of safety, alteration of the normal anatomy due to previous surgical resection, presence of severe esophagitis defined as a Los Angeles classification of grade C or higher, or therapeutic procedures for treatment of BE
Standards	Minimum standard: ≥ 90 % Target standard: ≥ 95 %
Consensus agreement	Statement 1: First round: 96.3 %, Second round: 89.7 % Statement 2: First round: 96.3 %, Second round: 86.2 %
PICO number	9 and 10
Evidence grading	Low quality

The acceptance of this performance measure is based on agreement with the following statements:

- Adequate inspection time in a surveillance UGI endoscopy for patients with nondysplastic BE should take ≥ 1 minute per cm of circumferential extent of Barrett's epithelium. Agreement: 96.3 % (first round), 89.7 % (second round)
- Adequate inspection in a surveillance UGI endoscopy for patients with nondysplastic BE should include the use of chromoendoscopy (acetic acid and/or virtual). Agreement: 96.3 % (first round), 86.2 % (second round)

BE inspection is a very specific but demanding UGI diagnostic procedure, which might need a longer inspection time, especially for longer segments, so the time allocated for this type of UGI endoscopy is often inadequate. A fixed time slot of 20 minutes that is suggested for a diagnostic endoscopy is insufficient for a specific BE surveillance UGI endoscopy [28].

Although there are no direct data evaluating the impact of endoscopic examination time on the dysplasia detection rate,

two post-hoc analyses from RCTs support the relevance of adequate inspection time for BE [106, 107]. In another study an inspection time over 1 minute per cm of Barrett's epithelium provided higher detection rates of endoscopically visible lesions and high grade dysplasia/adenocarcinoma [108]. Additionally, another study showed that a longer procedural time was associated with increased dysplasia detection on both four-quadrant (OR 1.10, 95 %CI 1.00 to 1.20; $P = 0.04$) and targeted biopsies (OR 1.21, 95 %CI 1.04 to 1.40; $P = 0.01$) for patients with BE > 6 cm, when increasing the inspection by 0.9 minutes for each additional 1 cm of Barrett's epithelium, resulting in a median examination time from intubation to extubation of 16.5 minutes [109].

Regarding chromoendoscopy, ESGE has recommended the use of virtual or acetic acid chromoendoscopy in endoscopic surveillance for patients with BE [5]. Of note, neither technique can replace the additional use of the Seattle protocol for biopsy sampling as sufficient evidence is lacking that chromoendoscopy can be used as a standalone technique for dysplasia detection [110].

In a crossover trial of 123 patients undergoing screening or surveillance for BE in a tertiary referral center, comparing high definition white-light endoscopy with targeted and random biopsies according to the Seattle protocol versus virtual chromoendoscopy with guided targeted biopsies, there was no difference in metaplasia detection, but significantly fewer biopsies were needed in the virtual chromoendoscopy group [111]. These findings were confirmed in one prospective study, while in another comparative trial of standard definition endoscopy versus virtual chromoendoscopy, fewer biopsies were needed but also a significantly higher yield of dysplasia was found [112, 113].

A meta-analysis of 14 prospective studies and clinical trials reported an increased yield of dysplastic and neoplastic lesions by 34 % (95 %CI 14 % to 56 %; $P < 0.01$) in virtual chromoendoscopy and by 35 % (95 %CI 13 % to 56 %; $P < 0.01$) in acetic acid chromoendoscopy versus white-light endoscopy, with no significant difference found between the two modalities ($P = 0.45$) [114]. This suggests an additive effect of chromoendoscopy that can be leveraged for targeted biopsies when the Seattle protocol is performed.

In conclusion, in a routine BE surveillance UGI endoscopy, ≥ 1 minute of inspection time per cm of Barrett's is advised and chromoendoscopy, either virtual or with acetic acid, should be used. This means that the time slot allocated to these specific BE surveillance procedures should be anticipated and extended to 30–40 minutes according to the estimated BE length, and high definition endoscopes should be available.

Minor performance measure	Chromoendoscopy in patients at risk for squamous cell carcinoma (SCC)
Description	Percentage of procedures with accurate application of virtual chromoendoscopy in patients referred for screening for SCC after curative treatment of ear, nose, and throat, or lung cancers

(Continuation)

Minor performance measure	Chromoendoscopy in patients at risk for squamous cell carcinoma (SCC)
Domain	Identification of pathology
Category	Process
Rationale	Better detection of early esophageal SCC in patients with an increased risk, as virtual chromoendoscopy is superior to Lugol staining
Construct	Record the use of virtual chromoendoscopy in patients with a history of ear, nose, and throat, or lung cancer treated with a curative intent **Denominator**: All diagnostic UGI endoscopies performed for screening for a second primary tumor after curative treatment of ear, nose, and throat, or lung cancer **Numerator**: Procedures in the denominator that report the use of virtual chromoendoscopy **Exclusions**: Early termination of procedure owing to patient intolerance or for reasons of safety, patients treated without curative intent, or patients that reached 75 years of age, or with life-expectancy < 5 years
Standards	Minimum standard: ≥ 90 % Target standard: ≥ 95 %
Consensus agreement	First round: 85.2 %, Second round: 82.8 %
PICO number	11
Evidence grading	Low quality

The acceptance of this performance measure is based on agreement with the following statement:

- Adequate inspection for a diagnostic UGI endoscopy in patients with a history of ear, nose, and throat, or lung tumors treated with curative intent should include the use of virtual chromoendoscopy. Agreement: 85.2 % (first round), 82.8 % (second round)

Screening for an esophageal second primary tumor in patients previously diagnosed with SCC of the head and neck, or lung cancer can lead to the diagnosis of early squamous esophageal cancers in up to 5.0 % (95 %CI 2.4 % to 8.9 %) of patients, showing a clinical benefit in terms of resectable esophageal lesions compared with those evaluated because of symptoms [18, 115]. Given the significant reduction in overall survival once a second primary tumor is detected, screening UGI endoscopy after a diagnosis of SCC of the head and neck might be beneficial in patients who have been treated with curative intent [116].

One meta-analysis, including 12 studies, compared the diagnostic accuracy of virtual chromoendoscopy versus Lugol staining for the detection of high grade dysplasia and SCC of the esophagus [117]. While sensitivity for the detection of high

grade dysplasia or esophageal cancer was not significantly different between virtual chromoendoscopy and Lugol staining (88 % [95 %CI 86 % to 93 %] vs. 92 % [95 %CI 85 % to 96 %]), specificity for virtual chromoendoscopy was significantly higher (82 % [95 %CI 80 % to 85 %] vs. 88 % [95 %CI 86 % to 90 %]) in a per-patient analysis. Two recent randomized trials confirmed the superiority of virtual chromoendoscopy. One study demonstrated equal negative predictive value but superior positive predictive value, while another showed the need for fewer biopsies and shorter examination times [118, 119]. Finally, even in an expert tertiary center, Lugol staining led to a false-positive rate of up to 84.3 % [18].

In conclusion, despite the limited data available and the scarce population in question, in patients referred for an esophageal SCC screening UGI endoscopy, after curative treatment of an SCC of the head and neck, or lung cancer, virtual chromoendoscopy should be applied, preferably by an experienced endoscopist with a specific focus in detection of early neoplasia. Lugol staining remains a validated technique that can be used along with virtual chromoendoscopy.

4 Domain: Management of pathology

Key performance measure	Seattle protocol for BE
Description	Percentage of patients undergoing routine BE surveillance with proper application of the Seattle protocol
Domain	Management of pathology
Category	Process
Rationale	Adequate inspection of certain conditions might imply taking biopsies for pathology assessment In BE surveillance, the Seattle protocol improves dysplasia detection, allowing an interval between surveillance endoscopies according to guidelines
Construct	Record the Prague classification In BE surveillance, record the use of the Seattle protocol, with four biopsies taken every 2 cm along the circumferential extent of the Barrett's epithelium. Biopsies should be collected in separate jars for targeted biopsies and per level for random biopsies **Denominator**: BE surveillance endoscopies **Numerator**: Procedures in the denominator where biopsies were taken according to the Seattle protocol **Exclusions**: Early termination of procedure owing to patient intolerance or for reasons of safety, alteration of the normal anatomy due to previous surgical resection, presence of severe esophagitis defined as a Los Angeles classification of grade C or higher, or therapeutic procedures for treatment of BE, or contraindication for biopsies
Standards	Minimum standard: ≥ 90 % Target standard: ≥ 95 %
Consensus agreement	First round: 92.6 %, Second round: 82.8 %
PICO number	12
Evidence grading	Moderate quality

The acceptance of this performance measure is based on agreement with the following statement:

- Adequate UGI surveillance for patients with nondysplastic BE should include biopsies taken according to the Seattle protocol. Agreement: 92.6 % (first round), 82.8 % (second round)

Regarding BE surveillance endoscopies, the Seattle protocol consists of targeted biopsies of any visible lesion within the Barrett's epithelium, followed by four-quadrant biopsies taken at 2-cm intervals, all collected in different containers per level, and per lesion [5]. Any suspicious areas should be biopsied before taking the random biopsies to avoid bleeding that may impair adequate visibility. The Seattle protocol has been endorsed in guidelines to be the standard method for BE surveillance. Despite these recommendations, variability in adherence to the Seattle biopsy protocol is reported.

One multicenter study, with 20 155 UGI endoscopies from 153 practices and 572 endoscopists, based on a population-based registry, showed adherence to the Seattle protocol of 86 % [120]; however, a meta-analysis of 56 studies including 14 002 patients and 4932 endoscopists showed an adherence of only 49 % (95 %CI 36 % to 62 %) [121]. In a cohort study of 2245 BE patients under surveillance, the dysplasia detection rate was reduced by almost half when there was nonadherence to the biopsy protocol (OR 0.53, 95 %CI 0.35 to 0.82), and a longer BE segment was associated with significantly reduced adherence (3–5 cm, OR 0.14, 95 %CI 0.10 to 0.19; 6–8 cm, OR 0.06, 95 %CI 0.03 to 0.09; ≥ 9 cm, OR 0.03, 95 %CI 0.01 to 0.07) [122]. Also, in another cohort study, a 13-fold higher detection rate of prevalent dysplasia was obtained when the Seattle protocol was applied versus nonsystematic biopsies [123]. Finally, a meta-analysis confirmed that Seattle protocol adherence significantly increased the detection of dysplasia compared with nonadherence (RR 1.90, 95 %CI 1.36 to 2.64; $I^2 = 45$ %); for both low grade dysplasia (RR 2.00, 95 %CI 1.49 to 2.69; $I^2 = 0$ %) and high grade dysplasia/adenocarcinoma (RR 2.03, 95 %CI 0.98 to 4.24; $I^2 = 28$ %) [124].

From a practical viewpoint, containers should be labelled according to the biopsy location, as suggested in our previous statement, adopting a coding system that unequivocally identifies the location allocated to each container using a two number combination "xxyy" [1]. In this system, "xx" refers to the distance from the incisors and "yy" to the location on a clock. By convention, the 3-o'clock position corresponds to the lesser curvature (scope in neutral position), with "xx00" indicating random biopsies. For instance, 4000 would indicate random biopsies taken at 40 cm from the incisors, while 3805 stands for a targeted biopsy taken from a lesion at 38 cm from the incisors and in the 5-o'clock position.

In conclusion, applying the Seattle protocol for patients with BE is the recommended strategy to follow and monitor.

Key performance measure	MAPS protocol for gastric precancerous assessment
Description	Percentage of patients in which it is relevant to address the risk of gastric cancer during a first diagnostic UGI endoscopy, by combining the use of virtual chromoendoscopy and proper histological characterization
Domain	Management of pathology
Category	Process
Rationale	Adequate inspection of certain conditions, including the use of virtual chromoendoscopy might necessitate taking biopsies for pathology assessment. In patients where the assessment of risk for gastric cancer is relevant, the MAPS protocol allows a more detailed assessment of risk and a proposal for endoscopic surveillance in those who will most benefit
Construct	In patients where the assessment of risk for gastric cancer is relevant, record the use of the MAPS protocol after virtual chromoendoscopy inspection, with two biopsies taken from the antrum in one vial and two biopsies taken from the corpus in a second vial **Denominator**: All diagnostic UGI endoscopies in patients where the assessment of risk for gastric cancer is relevant **Numerator**: Procedures in the denominator assessing risk for gastric cancer where biopsies were taken according to the MAPS protocol Procedures in the denominator that report the use of virtual chromoendoscopy **Exclusions**: Therapeutic procedures, emergency procedures, early termination of procedure owing to patient intolerance or for reasons of safety, or alteration of the normal anatomy due to previous surgical resection or bariatric surgery, contraindications for biopsies, or surveillance procedures in patients already identified with extensive gastric precancerous conditions
Standards	Minimum standard: ≥ 90 % Target standard: ≥ 95 %
Consensus agreement	First round: 96.3 %, Second round: 93.1 %
PICO number	13
Evidence grading	Low quality

The acceptance of this performance measure is based on agreement with the following statement:

- Adequate diagnostic UGI endoscopy for patients evaluated for their risk of gastric cancer should include biopsies taken according to the MAPS guideline. Agreement: 96.3 % (first round), 93.1 % (second round)

Regarding gastric cancer risk assessment, currently, population-based screening for gastric cancer is not recommended in Europe as most countries have a low-to-intermediate risk for this malignancy. Opportunistic screening and diagnosis of gastric lesions or precancerous conditions that identify patients at higher risk should however be performed during a routine diagnostic UGI endoscopy [125, 126]. The main indications for a diagnostic UGI endoscopy are to study symptomatic patients with various digestive complaints, such as dyspepsia, esophageal reflux, upper abdominal pain, and iron deficiency anemia, among others [4, 10, 12, 28].

Advances in endoscopic imaging, including the use of virtual chromoendoscopy, allow endoscopists to perform a "real-time" characterization of the gastric mucosa, including the detection of normal findings, inflammation, gastric atrophy, and intestinal metaplasia [11, 101, 103].

A normal gastric mucosa is defined by certain endoscopic characteristics: (a) a homogeneously distributed rose/pinkish color, (b) the absence of visibility of the atrophic border, (c) regular and normal thickness of gastric folds in the corpus, and (d) a regular arrangement of collecting venules in the corpus and fundus [101, 127]. By applying optically magnified endoscopy, the normal pyloric and fundic glands can be observed as ridge and round patterns, respectively [128, 129].

The gastric mucosa can be damaged by various factors that lead to inflammatory changes [130]. Inflammation in the gastric mucosa is characterized by a reddish mucosa (erythema), edema, nodularity, enlargement of the gastric folds, and progressive disappearance of the regular arrangement of the collecting venules in the corpus and fundus [131].

Recognizing gastric atrophy is important because it is the first step in the carcinogenesis process, which can lead to the development of intestinal and diffuse types of adenocarcinomas (mainly related to *H. pylori* infection) and type-1 neuroendocrine tumors (mainly related to autoimmune gastritis) [130]. Endoscopic gastric atrophy can be detected by the pale color of the mucosa and the easy visibility of submucosal vessels, features enhanced by virtual chromoendoscopy [102, 132, 133]. Gastric atrophy caused by *H. pylori* typically begins in the distal compartment (the antrum/incisura) and progressively moves toward the proximal compartment (the corpus/fundus). This progression has been described as the advancement of the endoscopic atrophic border in the Kimura–Takemoto classification, with the severity correlated with an increased risk of gastric cancer [99, 100]. Conversely, in cases of gastric atrophy caused exclusively by autoimmune gastritis, endoscopic gastric atrophy is identified only in the proximal compartment [134]; however, these two etiologies can coexist and produce gastric atrophy affecting both compartments.

Intestinal metaplasia is an additional step toward the development of most gastric cancers, especially intestinal-type adenocarcinomas. Its endoscopic recognition is feasible under white-light endoscopy alone, with signs such as slightly flat elevations with whitish patches, map-like redness, mottled reddish depression, or a white opaque substance [135], but it is better detected under high definition endoscopy and blue-light spectrum virtual chromoendoscopy, where it is characterized by a typical whitish-bluish crest, composed of two structures observable under magnification: the light-blue crest and the marginal turbid band [135–139]. The extension and severity of intestinal metaplasia can be further assessed endoscopi-

cally using the EGGIM classification, where a score of ≥5 indicates a higher risk for gastric cancer [103–105]. Nevertheless, the endoscopic recognition of intestinal metaplasia in both the antrum/incisura and corpus can be useful in identifying patients at higher risk for gastric cancer [11, 140, 141].

Any diagnostic UGI endoscopy performed in patients for the assessment of digestive symptoms can represent an opportunity to identify those at higher risk for gastric cancer, where the diagnosis or suspicion of gastric atrophy or intestinal metaplasia after the use of virtual chromoendoscopy should be complemented by targeted or random biopsies according to the MAPS protocol, using two separated vials: one for the distal compartment (antrum ± incisura) and another for the proximal compartment (corpus) [11]. In cases with endoscopic inflammatory findings but without suspicion of gastric atrophy or intestinal metaplasia, and only after the use of virtual chromoendoscopy by an experienced endoscopist, biopsies may be taken from both antrum (± incisura) and corpus in one single vial to rule out *H. pylori* and other etiologies [142–146].

In conclusion, applying the MAPS protocol to address gastric cancer risk, in a targeted or random technique, after the use of virtual chromoendoscopy is the recommended strategy to follow. An example of the sites to perform the biopsies is provided in ▶ **Fig. 3**.

5 Domain: Complications

Key performance measure	Complications after therapeutic procedures
Description	Percentage of patients monitored for complications (adverse events) after therapeutic UGI endoscopy
Domain	Complications
Category	Outcome
Rationale	Monitoring the incidence of complications after therapeutic UGI endoscopy is important to assess the safety of procedures, to identify targets for improvement, and to allow patients to be accurately consented for procedures
Construct	Record any therapeutic procedures including: ▪ type of procedure ▪ organ of procedure ▪ type of complication ▪ time from therapeutic procedure to the onset of the complication ▪ consequences of complication Patient should be contacted 30 days after the procedure **Denominator**: All therapeutic UGI procedures **Numerator**: Therapeutic procedures in the denominator with accurate assessment of the existence of complications or their exclusion **Exclusions**: Emergency procedures or diagnostic procedures
Standards	Minimum standard: ≥90 % Target standard: ≥95 %
Consensus agreement	First round: 96.3 %, Second round: 96.6 %
PICO number	14
Evidence grading	Very low quality

The acceptance of this performance measure is based on agreement with the following statement:

- Adequate safety after a therapeutic UGI endoscopy should be assessed by monitoring the incidence of complications. Agreement: 96.3 % (first round), 96.6 % (second round)

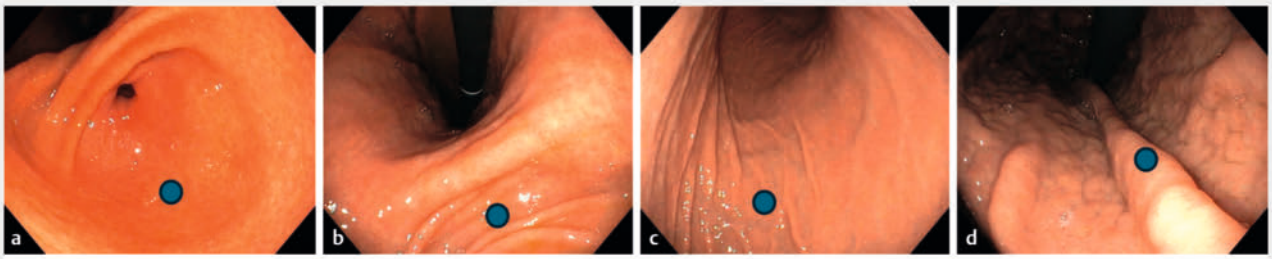
While all other performance measures in this position statement are related to diagnostic UGI endoscopy, this is the only one that refers specifically to therapeutic UGI endoscopy. In contrast to diagnostic UGI endoscopy, in which AE rates are minimal, therapeutic UGI endoscopy has a non-negligible rate of AEs that are part of the technique itself, which should remain below a certain threshold. All AEs and harms related to any therapeutic UGI procedure conducted in any endoscopy unit should be addressed and accounted for.

The AEs should be considered by procedure but also by organ involved and the type of complication. The most common AEs are bleeding, perforation, stenosis, and stent complications, which include migration, ingrowth, or overgrowth.

▶ **Table 3** [147–159] includes the AE rates for each complication, organ, and technique for the most usual therapeutic procedures. Results were obtained from cohort studies, some of them prospectively designed, but also reviews and meta-analyses [147–160]. For very specific and less frequently performed UGI therapeutic procedures, specific guidelines or reviews should be consulted. Considering the reliability of the studies selected, the reported complication rates should be regarded as the threshold, ideally not to be exceeded, by endoscopic technique, by endoscopist, and by endoscopic center.

Patients should be contacted after the procedure to assess post-procedural complications in person, by phone, or by digitally secured e-services; ideally, the patient should have been notified beforehand that this contact would be made. Expert consensus is that 30 days after the procedure may be the ideal time gap to capture all possible AEs.

When an AE has occurred, we suggest recording: (i) the type of procedure (resection of lesion [specify], dilation [pneumatic or Savary], stent placement, percutaneous endoscopic gastrostomy insertion, variceal band ligation, ablation, or other); (ii) organ of procedure (esophagus, stomach, or duodenum); (iii) type of complication (bleeding, perforation, stenosis, stent migration, infection, death, anesthesia related, environment related, or other); (iv) time from therapeutic procedure to the onset of the complication, in days; and (v) consequences of the complication (hospital admission, symptomatic medica-



▶ **Fig. 3** Example of the sites to perform the targeted or random biopsies in patients being evaluated for their risk of gastric cancer, with each single biopsy represented by a dot, according to the Management of precancerous conditions and lesions in the stomach (MAPS) protocol, using two separate vials: **a** greater curvature of antrum; **b** lesser curvature of antrum; **c** greater curvature of corpus; **d** lesser curvature of corpus.

▶ **Table 3** Adverse event rates for each complication, organ, and therapeutic procedure.

Procedure	Organ	Complication	Rate, %	Reference
Polypectomy/endoscopic mucosal resection	Esophagus	Bleeding	3.1	[147]
		Perforation	0.4	[147]
		Stenosis	6.4	[147]
	Stomach	Bleeding	6.9	[148]
		Perforation	1.2	[148]
	Duodenum	Bleeding	6.7	[149]
		Perforation	0.9	[149]
Submucosal dissection	Esophagus	Bleeding	1.7–2.8	[150, 151]
		Perforation	1.5	[150, 151]
		Stenosis	6.3–11.6	[150, 151]
	Stomach	Bleeding	7.2	[148]
		Perforation	2.6–3.2	[148, 152]
	Duodenum	Bleeding	8.9	[149]
		Perforation	10.4	[149]
Dilation – pneumatic	Esophagus	Perforation	1–3	[153–155]
Dilation – Savary	Esophagus	Perforation	5	[154]
Dilation for achalasia	Esophagus	Perforation	5.3	[156]
Stenting for stenosis	Esophagus	Stent migration	11.4–16.3	[157]
		Bleeding	5.4–9.2	[157]
		Ingrowth/overgrowth	11.4–14.7	[157]
Stenting for leaks, fistulas, or perforations	Esophagus	Stent migration	16–24	[158]
		Bleeding	0.6–1.0	[158]
		Perforation	1–2	[158]
Percutaneous endoscopic gastrostomy	Stomach	Bleeding	0.3	[159]
		Perforation	0.5	[159]
		Peritonitis	0.5	[159]

tion, antibiotics, laboratory or radiological tests, blood transfusion, endoscopic intervention, radiological intervention, surgical intervention, organ dysfunction, death, or other) [161]. This will allow comparison with published thresholds, root-cause analysis, and classification of AEs according to the recently validated Adverse events GastRointEstinal Endoscopy (AGREE) classification [162, 163]

6 Domain: Patient experience

Minor performance measure	Patients' experiences
Description	Patients' experiences during and after UGI endoscopy should be routinely measured and self-reported by the patients using validated scales
Domain	Patient experience
Category	Outcome
Rationale	Monitoring patient experience helps to identify areas for improvement and ensures that the delivery of UGI endoscopy aligns with patient expectations, fostering a patient-centered and quality-driven healthcare environment
Construct	Record patient experience by one of the following validated questionnaires: ▪ Modified Group Health Association of America-9 (mGHAA-9) ▪ Gastrointestinal Endoscopy Satisfaction Questionnaire (GESQ) ▪ Newcastle ENDOscopic Patient-Reported Experience Measure (ENDOPREM) Define a period within the annual endoscopy department activity to collect ≥ 100 questionnaires that are representative of the UGI endoscopy activity Define the metric the department will measure. For instance: best response, aggregate of the two best responses, or other **Denominator**: All UGI endoscopies where the patient experience was measured using a validated scale **Numerator**: Procedures in the denominator in which the patient reported his experience within the defined metric (best response, aggregate of the two best responses, or other) **Exclusions**: Emergency procedures
Standards	Minimum standard: ≥ 90 % Target standard: ≥ 95 %
Consensus agreement	First round: 86.2 %, Second round: 100 %
PICO number	15
Evidence grading	Very low quality

A previous statement did not reach agreement (agreement 70.4 %). The acceptance of this performance measure is based on agreement with the following updated statement:

- Patients undergoing a diagnostic UGI endoscopy should have their experience measured using a validated scale, to promote a patient-centered and quality-driven environment. Agreement: 86.2 % (first round), 100 % (second round)

Patient experience as a performance measure is crucial for enhancing patient care, engagement, and overall healthcare quality, including UGI endoscopy activity. Positive patient experience can encourage participation in screening programs and repeated attendance for recommended surveillance procedures. Conversely, dissatisfaction with prior UGI endoscopic procedures (due to embarrassment, discomfort, or other) can deter patients from returning [164, 165].

Some patient-reported experience measures (PREMs) using questionnaires have been developed and validated to assess patients' experiences [166]. Examples are the modified Group Health Association of America-9 (mGHAA-9), the Gastrointestinal Endoscopy Satisfaction Questionnaire (GESQ), and the Newcastle ENDOscopic Patient-Reported Experience Measure (ENDOPREM) [167–169]. These tools cover various aspects of the patient experience, from pre-procedure information to post-procedure care.

The modified mGHAA-9 questionnaire measures patient satisfaction across different stages, from pre-procedure information and healthcare staff conduct, to post-procedure care, with a nine-question questionnaire, each question rated on a 5-point scale [167].

The GESQ measures patient satisfaction again across different stages, also including pre-procedure information, healthcare staff conduct, and post-procedure care, but using a more detailed questionnaire with 24 questions, each question again rated on a 5-point scale [168].

The Newcastle ENDOPREM, designed with a patient-centered approach, captures experiences throughout the entire journey, including pre-procedure information, anxiety, communication, post-procedure care, and overall experience [169]. It is a much more complex questionnaire with seven sections and 69 questions, most of them using a 5-point scale, but also including 10-point scales and open questions for free-text reply.

Studies assessing patients' experience have reported some relevant findings. One study interviewed patients who had undergone digestive endoscopy to assess the importance of various aspects of satisfaction, highlighting significant factors for the patients that are not included in the modified mGHAA-9 questionnaire, such as discomfort during the procedure and the technical skill of the endoscopist, concluding that endoscopy satisfaction assessments should cover access, appointments, information, procedure, and discharge [170]. Other studies evaluating specifically the impact of sedation on patient experience concluded that specific questionnaires may be needed for this situation, such as the Patient Satisfaction with Sedation Instrument (PSSI) or the PROcedural Sedation Assessment Survey (PROSAS) [171, 172].

Regarding the delivery of the questionnaires, timing, method, and type (written paper or digital) of questionnaire delivery can influence patient feedback, and recall bias may affect responses, as well as sedation. According to a prospective study, most patients initially appeared very satisfied after

the endoscopy (possibly owing to sedation and the survey setting), but satisfaction tended to decrease over time [173]. Another study compared satisfaction scores obtained by same-day on-site surveys versus after-procedure (within 1 week) email surveys, with the on-site survey being given after the endoscopist had discussed the results of the procedure and follow-up plans with the patient [174]. The on-site surveys yielded higher satisfaction scores than email methods, influenced by immediate discussion of results and follow-up plans by the endoscopist. Finally, one study randomized 63 outpatients to receive the mGHAA-9 questionnaire by mail, phone, or email within 1 week after their procedure, and nonresponders to the standard mail and email surveys were subsequently contacted by telephone to determine their level of satisfaction [175]. The phone survey response rate was higher (90 %) than email (70 %) or standard mail (85 %), although email was the most cost-efficient mode; the nonresponders were more satisfied, suggesting that feedback from responders might underestimate overall satisfaction.

Another important factor to consider is who delivers the questionnaire to the patient, a doctor, a nurse, or an assistant, and whether an assistant should be present or not to help the patient during completion of the questionnaire. For instance, doctors may lend importance to the survey, but might pressure patients to respond positively; nurses, having closer patient rapport, might elicit more honest feedback [176].

Using trained assistants to provide neutral support to deliver the questionnaire can ensure efficiency and consistency in high volume settings, as they can manage the administrative workload, allowing clinical staff to focus on patient care. Having an assistant to help patients to complete the questionnaires can improve response rates and the completeness of data collected. This assistance is particularly beneficial for patients who might have difficulties understanding the questionnaire or who need physical assistance owing to health conditions. On the other hand, allowing patients to complete the questionnaire independently can reduce potential bias, ensuring that responses are entirely the patient's own.

Independently of the staff delivering the questionnaire, it seems important to have meetings to review patient feedback to plan improvements [177]. In a prospective study of 202 patients' self-reported preferences and expectations for UGI endoscopy, the technical skill and personal manner of the endoscopist were identified as top priorities, with environmental factors deemed less important [178].

In addition, it is important to note that patient comfort during an endoscopy might be perceived differently by the staff and the patients. In a study validating the Nurse-Assessed Patient Comfort Score (NAPCOMS) for colonoscopy, the score was compared with endoscopists' and patients' reported global comfort using a visual 4-point Likert scale [179]. There was a high agreement between the NAPCOMS and the endoscopists' ratings, but only a moderate agreement between the NAPCOMS or the endoscopists' ratings and the patients' ratings.

In our digital age, using apps and artificial intelligence can streamline questionnaire delivery and improve patient services, such as through educational videos before endoscopic procedures [180]. Also, involving patients in shared decision-making, especially for therapeutic procedures, can enhance the patient-centered approach [181].

Finally, language is an issue when delivering a questionnaire and these should be validated for specific languages and not just translated from the original English version and applied without a formal validation of the specific language version. Therefore, we strongly encourage member societies and researchers to translate validated questionnaires into their own language and also culturally adapt them where necessary, and then validate them in patient groups and interviews.

In conclusion, evaluating patient experience with validated PREMs and adjusting delivery details according to each center's needs is crucial. To allow comparability, the endoscopy department should choose one of the available questionnaires and always apply it in the same way, choosing between one of several options: same-day or after-day delivery, written paper or digital software, delivery by a doctor, nurse, or assistant, and completion with or without the presence of an assistant. Regularly reviewing feedback to implement necessary improvements can significantly enhance patient care and satisfaction.

7 Domain: Post-procedure

Key performance measure	BE surveillance according to guidelines
Performance measure	Patients with nondysplastic BE who are scheduled for endoscopic surveillance should be monitored for guideline interval adherence
Description	Percentage of patients with nondysplastic BE who are scheduled for endoscopic surveillance according to guideline intervals
Domain	Post-procedure
Category	Process/structural
Rationale	Proper assessment, stratification of risk, and allocation of correct endoscopic surveillance interval for patients with nondysplastic BE allows accurate calculation of neoplasia incidence and improves patient outcomes
Construct	Record all patients with a diagnosis of BE Stratify the patient's risk according to histological and/or endoscopic criteria Record proposed endoscopic surveillance intervals and compare them with the recommended guidelines **Denominator**: All patients with a diagnosis of nondysplastic BE **Numerator**: Patients in the denominator where the recommended endoscopic surveillance interval is according to the respective guideline adopted **Exclusions**: Therapeutic procedures, emergency procedures, and patients who reached 75 years of age at the time of their last surveillance endoscopy, with life-expectancy < 5 years, or who do not wish to undergo surveillance or are judged to be medically unfit for surveillance
Standards	Minimum standard: ≥ 90 % Target standard: ≥ 95 %

(Continuation)

Key performance measure	BE surveillance according to guidelines
Consensus agreement	First round: 96.6 %, Second round: 96.0 %
PICO number	16
Evidence grading	Low quality

Two previous statements did not reach agreement (agreement was between 70.4 % and 77.8 %). The acceptance of this performance measure is based on agreement with the following updated and merged statement:

- Patients with nondysplastic BE in an endoscopic surveillance program should be monitored for guideline interval adherence. Agreement: 96.6 % (first round), 96.0 % (second round)

BE is defined as the presence of intestinal metaplasia of ≥ 1 cm extending into the distal esophagus, either measured circumferentially or as the presence of a 1-cm tongue [5]. Monitoring of adherence to recommended surveillance intervals allows for a reliable estimation of the rates of dysplasia or esophageal adenocarcinoma detection; however, the decision to include patients with BE in a surveillance program should be made on a case-by-case basis, providing that the detection of any lesion would have a relevant impact on the patient's prognosis [5, 182]. Updated evidence since the previous position statement includes a registry study of 1066 patients from a population-based cohort, where the combined high grade dysplasia or esophageal adenocarcinoma detection rate was just 4.9 % (95 %CI 3.8 % to 6.4 %), lower than previously reported by referral centers [183].

Nonendoscopic risk factors for neoplasia detection include patient age, male sex, and smoking status, but surveillance interval recommendations are mainly based on the BE length [5, 183]. However, no randomized clinical trial exists that has investigated the effect of BE surveillance and, in cohort studies that suggested a survival benefit of BE patients under surveillance, lead-/length-time bias might partially explain the observed differences in prognosis [184].

In conclusion, given the scarcity of evidence for a patient outcome-focused performance measure in BE management and real-life feasibility, the Working Group agreed that only the adherence to the recommended intervals should be monitored, as not all endoscopy centers with BE patients are linked to a dedicated surveillance registry.

Key performance measure	Gastric precancerous conditions surveillance according to guidelines
Performance measure	Patients with gastric precancerous conditions who are scheduled for endoscopic surveillance should be monitored for guideline interval adherence
Description	Percentage of patients with gastric precancerous conditions who are scheduled for endoscopic surveillance according to guideline intervals
Domain	Post-procedure
Category	Process/structural
Rationale	Proper assessment, stratification of risk, and allocation of correct endoscopic surveillance intervals for patients with gastric precancerous conditions allows an accurate calculation of neoplasia incidence and improves patient outcomes
Construct	Record all patients with a diagnosis of a gastric precancerous condition Stratify the patient's risk according to histological and/or endoscopic criteria Record proposed endoscopic surveillance intervals and compare them with recommended guidelines **Denominator**: All patients with a diagnosis of a gastric precancerous condition **Numerator**: Patients in the denominator where the recommended endoscopic surveillance interval is according to the respective guideline adopted **Exclusions**: Therapeutic procedures, emergency procedures, and patients who reached 75 years of age at the time of their last surveillance endoscopy, with life-expectancy < 5 years, or who do not wish to undergo surveillance or are judged to be medically unfit for surveillance
Standards	Minimum standard: ≥ 90 % Target standard: ≥ 95 %
Consensus agreement	First round: 96.6 %, Second round: 92.0 %
PICO number	17
Evidence grading	Low quality

Two previous statements did not reach agreement (agreement was between 70.4 % and 77.8 %). The acceptance of this performance measure is based on agreement with the following updated and merged statement:

- Patients with gastric precancerous conditions in an endoscopic surveillance program should be monitored for guideline interval adherence. Agreement: 96.6 % (first round), 92.0 % (second round)

For patients with gastric precancerous conditions, such as glandular atrophy or intestinal metaplasia, the evidence to support endoscopic surveillance is variable and sometimes contradictory [185, 186]. This variation can be explained by differences in several aspects, such as the biopsy-taking process, the quality of the specimen, and the pathologist's assessment.

Despite this variability, various guidelines agree on differentiating low risk from high risk patients. Based on this stratification, appropriate endoscopic surveillance should be recommended. Generally, patients at lower risk are not recommended for surveillance, while endoscopic surveillance every 3 years is advised for most high risk patients, with even more intensive follow-up for patients with a first-degree family history of gastric cancer [11].

To correctly stratify patients as low or high risk, two validated histological scores exist, the OLGA (Operative Link for Gastritis Assessment) and OLGIM (Operative Link on Gastric Intestinal Metaplasia Assessment) systems, which assess both the severity and extension of atrophic changes or intestinal metaplasia, respectively [187–189]. In both classifications, patients are stratified into five stages grouped into three categories: no risk (OLGA or OLGIM 0); low risk (OLGA or OLGIM I–II); and high risk (OLGA or OLGIM III–IV). It has been suggested that histological risk stratification could be done solely based on the extent of atrophic changes, regardless of severity [190].

Patients may also be stratified as low or high risk based on two endoscopic scales only, without histology, the Kimura–Takemoto classification for atrophy and the Endoscopic Grading of Gastric Intestinal Metaplasia (EGGIM) classification for intestinal metaplasia [99–101, 103–105]. Both endoscopic classifications also allow patients to be stratified into three categories.

The Kimura–Takemoto classification, based on identifying the atrophic border, stratifies patients as: no risk (absence of atrophic border, C0); low risk (affecting only the antrum or incisura, C1, with some studies including C2); and high risk (affecting the corpus, from C3 to O3, with some studies also including C2) [99, 100]. However, evidence for the routine application of the Kimura–Takemoto classification is lacking in Western countries [191].

For the EGGIM classification, identification and grading of intestinal metaplasia should be assessed in five areas: the lesser and greater curvature of the antrum, the incisura, and the lesser and the greater curvature of the corpus [103–105]. Each area should be graded into three categories: 0 (absence of intestinal metaplasia); 1 (presence of intestinal metaplasia < 30 %); and 2 (presence of intestinal metaplasia > 30 %). Patients with a score ≥ 5 have an increased risk for gastric cancer. The EGGIM, based on the severity and extent of intestinal metaplasia, stratifies patients as: no risk (EGGIM 0); low risk (EGGIM 1–4); and high risk (EGGIM 5–10).

▶ **Table 4** summarizes the available classifications and risk groups. For other specific situations, such as low risk patients with additional risk factors (surveillance might be considered) or high risk patients with a first-degree relative with gastric cancer (might benefit from a more intensive follow-up), a more detailed explanation is available [11].

In conclusion, for patients diagnosed to be at high risk for gastric cancer, independently of the stratification being by endoscopy only or histology, and the classification used, only adherence to the recommended intervals should be monitored. This will allow for epidemiological data collection and the gathering of evidence for an eventual new future performance measure, such as the neoplasia detection rate.

▶ **Table 4** Risk stratification according to histological and endoscopic classifications and endoscopic surveillance interval recommendation for patients with gastric precancerous conditions.

Validated classification	Gastric cancer risk		
	No risk	Low risk	High risk
OLGA	Stage 0	Stage I–II	Stage III–IV
OLGIM	Stage 0	Stage I–II	Stage III–IV
Kimura–Takemoto	C0	C1 and C2	C3 to O3
EGGIM	0	1–4	5–10
Surveillance recommendation	Not recommended	Not recommended	Every 3 years

EGGIM, Endoscopic Grading for Gastric Intestinal Metaplasia; OLGA, Operative Link for Gastritis Assessment; OLGIM, Operative Link on Gastric Intestinal Metaplasia Assessment.

Conclusions and research priorities

This paper describes an update of performance measures for UGI endoscopy generated by evidence-based consensus, supported by a robust methodology. Although most of the available evidence continues to be graded as low quality, this does not mean that the search for quality in UGI endoscopy is irrelevant; in fact, it just reinforces the need for further research in this field, which should be regarded as a priority.

The Working Group identified several research priorities in the field of UGI endoscopy, which are listed in ▶ **Table 5**. These include items such as definition of minimum and target standards to reach for each performance measure; premedication applicability versus sedation-related AE concerns; worldwide applicability of visibility scores, including a better definition of adequate scores for lesion detection; definition of the best time metric for a UGI endoscopy, meaning full inspection versus withdrawal time, and its respective best threshold, but also taking into consideration patients' comfort and experience; updated evidence regarding clinical relevance; and/or agreement of existing endoscopic scales, or even new scales; eventual new endoscopic techniques to replace random biopsy protocols; validation of translated versions of PREM questionnaires; best metric for patients' quality measurement; or having the Post-Endoscopy Upper GastroIntestinal Cancer (PEUGIC) rate as an additional measure; issues that might change the current performance measures in future updates of this position statement [192].

In conclusion, we continue to owe our patients the assurance that endoscopy services, and UGI endoscopy in particular, are performed at the highest quality and hope that the current proposed performance measures are a helpful tool in the pursuit of that goal.

▶ **Table 5** Suggested research priorities.

Item	Evidence lacking or in need of improvement
Fasting	Premedication applicability versus sedation-related adverse event concerns, and patients on glucagon-like peptide-1 receptor agonists
Visibility scores	Worldwide applicability, the need or not to achieve the highest scores for adequate lesion detection, and reliability agreements
Time	Definition of the best metric and its threshold, need for sedation, also balancing against patient comfort and experience
Terminology	New evidence regarding clinical relevance or agreement of existing scales, or even new scales
Biopsy protocols	Possible new endoscopic techniques to replace random biopsy protocols
Patients' experience	Validation of translated versions of patients' reported experience measures questionnaires Best metric for quality measurement
Post-endoscopy cancer	Evidence to propose the post-endoscopy upper gastrointestinal cancer (PEUGIC) rate as a measure, and its respective threshold
Standards	Minimum and target standards to reach

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Competing interests

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Supplementary file

Performance measures for upper gastrointestinal endoscopy: a European Society of Gastrointestinal Endoscopy (ESGE) Quality Improvement Initiative 2025 update

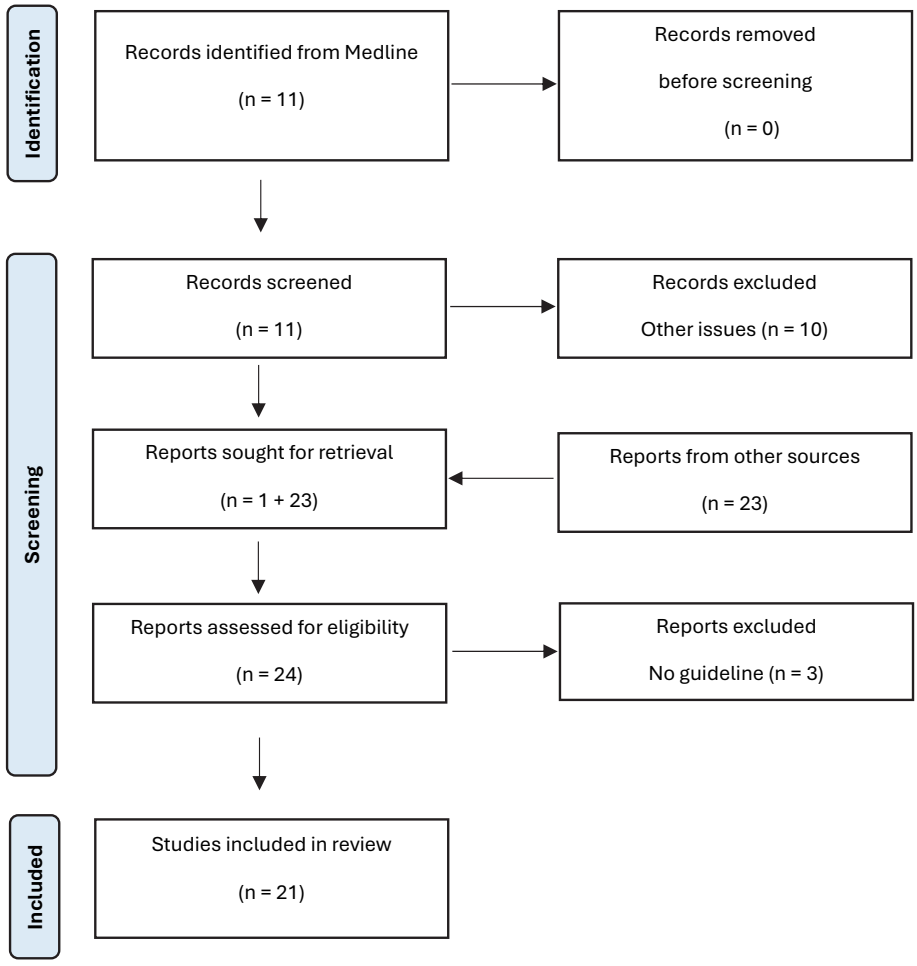
Contents

Appendix 1s PICO queries search: PubMed from 01/01/2015 to 31/12/2023

PICO nº 1: Indications
P: Patients scheduled for upper gastrointestinal endoscopy
I: Indication
C: No indication
O: Complication OR Perforation OR Bleeding OR Haemorrhage OR Aspiration OR Pneumonia OR intolerance OR incomplete

((Upper gastrointestinal endoscopy[Title/Abstract]) AND (Indication[Title/Abstract]) AND (Complication[Title/Abstract] OR Perforation[Title/Abstract] OR Bleeding[Title/Abstract] OR Haemorrhage[Title/Abstract] OR Aspiration[Title/Abstract] OR Pneumonia[Title/Abstract] OR intolerance[Title/Abstract] OR incomplete[Title/Abstract])) AND (("2015/01/01"[Date - Publication] : "2023/12/31"[Date - Publication]))

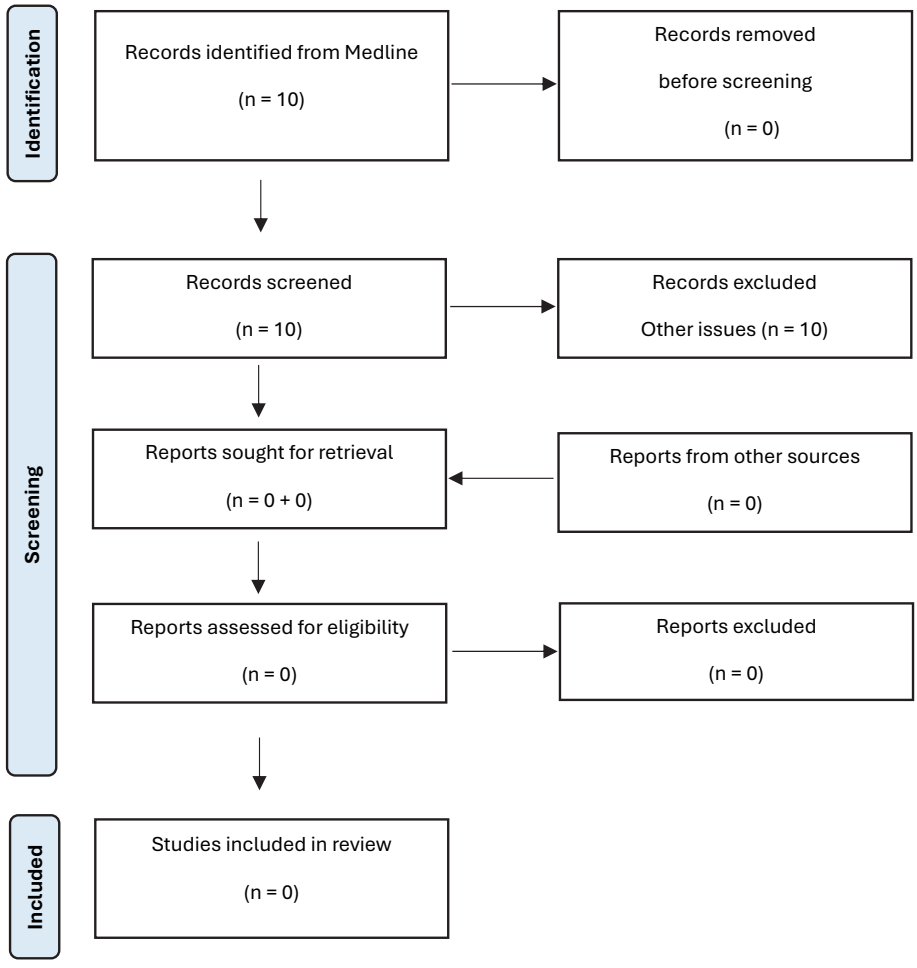
11 results



PICO nº 2: Fasting instructions
P: Patients scheduled for upper gastrointestinal endoscopy
I: more fasting for solids OR liquids
C: less fasting for solids
O: Complication OR Perforation OR Bleeding OR Haemorrhage OR Aspiration OR Pneumonia OR intolerance OR incomplete

"upper gastrointestinal endoscopy"[Title/Abstract] AND ("fasting"[Title/Abstract] OR "solids"[Title/Abstract] OR "liquids"[Title/Abstract]) AND ("Complication"[Title/Abstract] OR "Perforation"[Title/Abstract] OR "Bleeding"[Title/Abstract] OR "Haemorrhage"[Title/Abstract] OR "Aspiration"[Title/Abstract] OR "Pneumonia"[Title/Abstract] OR "intolerance"[Title/Abstract] OR "incomplete"[Title/Abstract]) AND 2015/01/01:2023/12/31[Date - Publication]

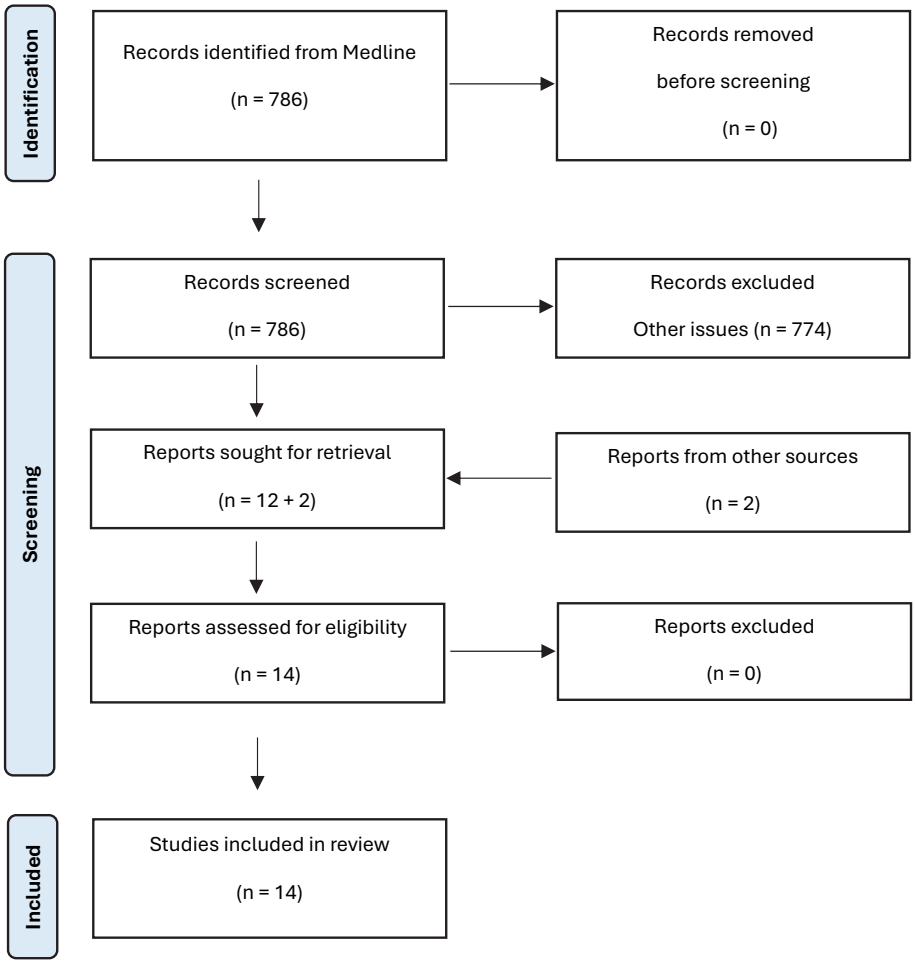
10 results



PICO nº 3: Time slot for upper gastrointestinal endoscopy
P: Patients scheduled for upper gastrointestinal endoscopy
I: More time OR standards
C: Less time
O: Standards

(endoscopy[Title/Abstract] AND gastrointestinal[Title/Abstract] AND upper[Title/Abstract] AND (standards[Title/Abstract] OR time[Title/Abstract])) AND (("2015/01/01"[Date - Publication] : "2024/12/31"[Date - Publication]))

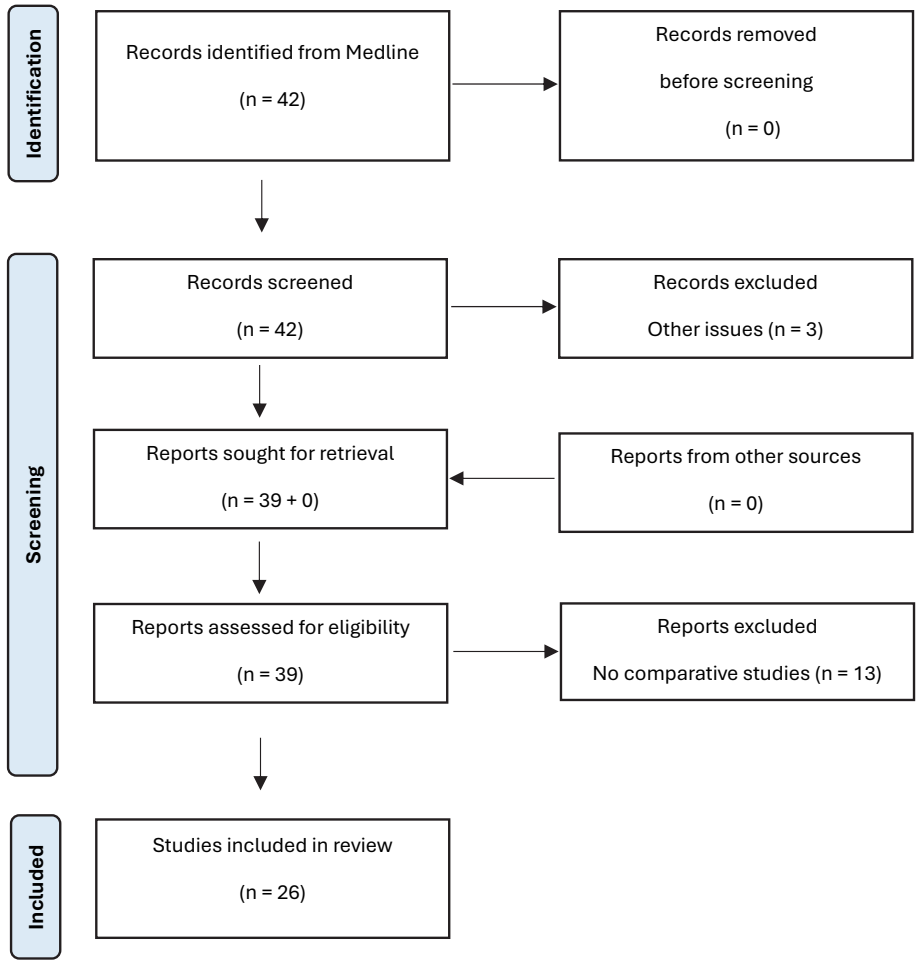
786 results



PICO nº 4: Visibility score
P: Patients scheduled for upper gastrointestinal endoscopy
I: Use of a Score OR scale
C: No use of a score OR scale
O: Dysplasia OR cancer OR carcinoma OR neoplasia OR detection OR diagnosis OR Visibility OR Visualization

((Upper gastrointestinal endoscopy[Title/Abstract]) AND (Score[Title/Abstract] OR scale[Title/Abstract]) AND (Dysplasia[Title/Abstract] OR cancer[Title/Abstract] OR carcinoma[Title/Abstract] OR neoplasia[Title/Abstract] OR detection[Title/Abstract] OR diagnosis[Title/Abstract] OR Visibility[Title/Abstract] OR Visualization[Title/Abstract])) AND (("2015/01/01"[Date - Publication] : "2023/12/31"[Date - Publication]))

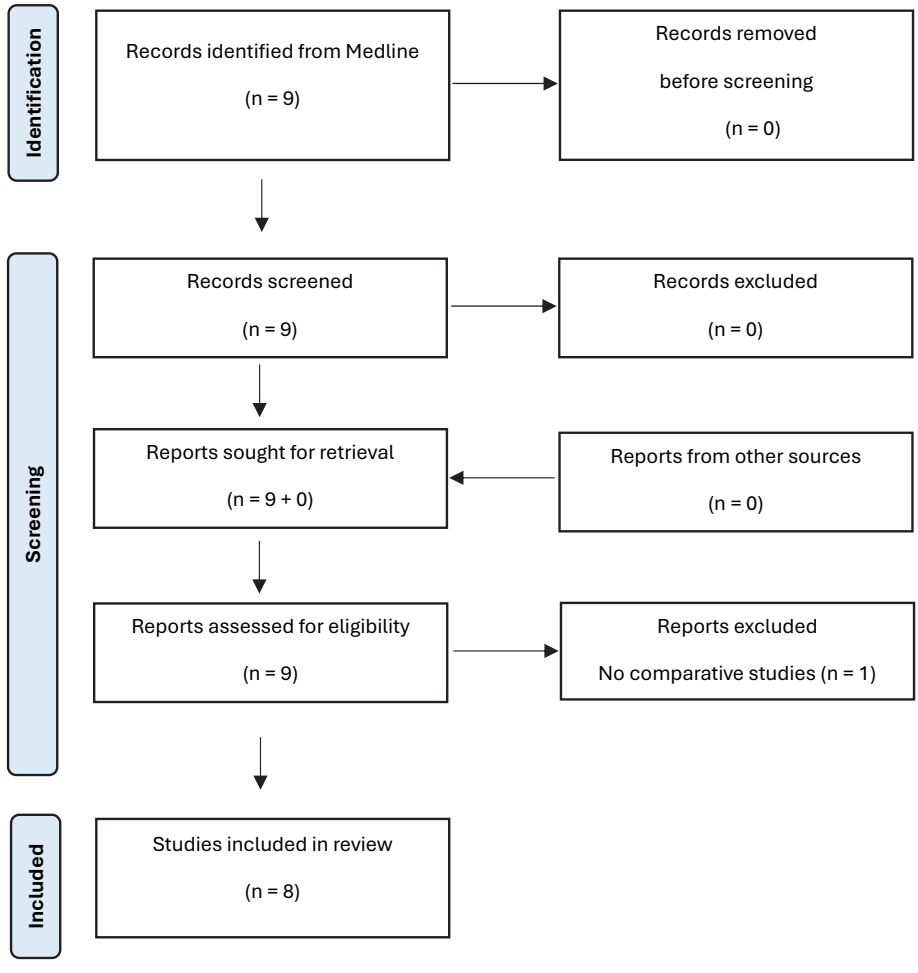
42 results



Pico nº 5: Simethicone
P: Patients scheduled for upper gastrointestinal endoscopy
I: Simethicone OR dimethicone OR acetylcysteine OR pronase
C: No Simethicone OR dimethicone OR acetylcysteine OR pronase
O: Dysplasia OR cancer OR carcinoma OR neoplasia OR detection OR diagnosis OR Visibility OR Visualization OR score

((Upper gastrointestinal endoscopy[Title/Abstract]) AND (Simethicone[Title/Abstract] OR dimethicone[Title/Abstract] OR acetylcysteine[Title/Abstract] OR pronase[Title/Abstract]) AND (Dysplasia[Title/Abstract] OR cancer[Title/Abstract] OR carcinoma[Title/Abstract] OR neoplasia[Title/Abstract] OR detection[Title/Abstract] OR diagnosis[Title/Abstract] OR Visibility[Title/Abstract] OR Visualization[Title/Abstract] OR score[Title/Abstract])) AND (("2015/01/01"[Date - Publication] : "2023/12/31"[Date - Publication]))

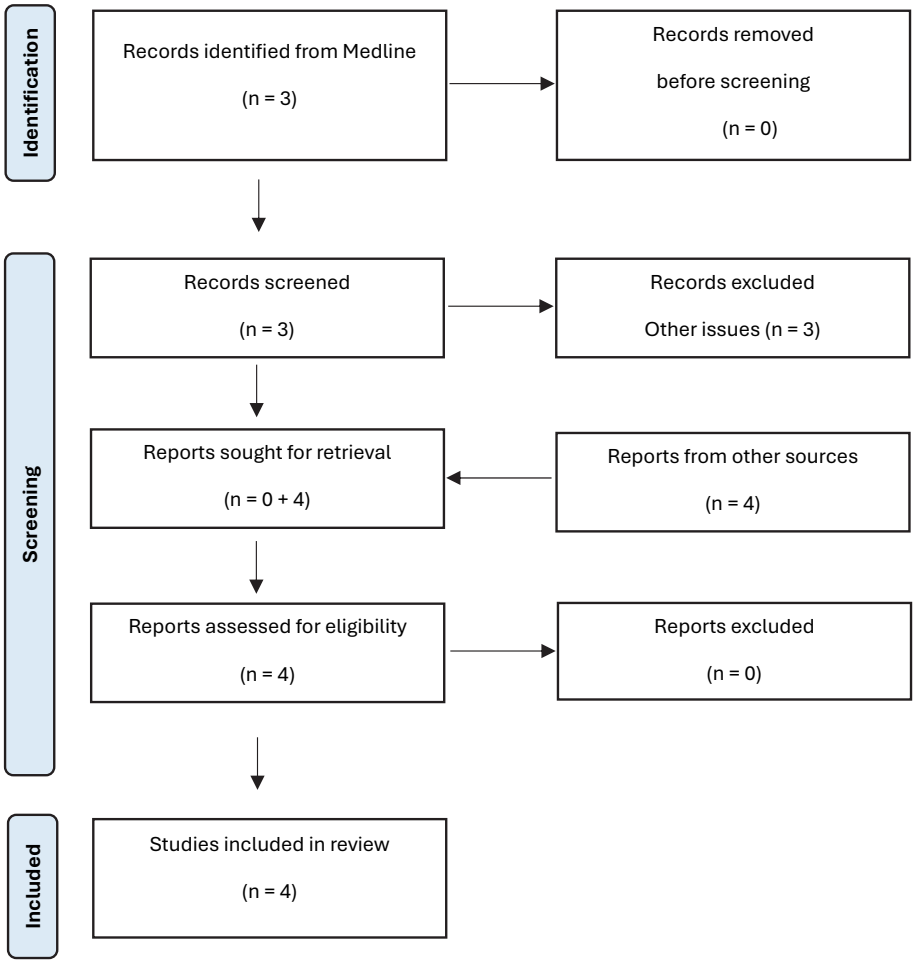
9 results



PICO nº 6: Photo documentation
P: Patients scheduled for upper gastrointestinal endoscopy
I: more photos/pictures
C: less photos/pictures
O: Diagnostic yield OR Dysplasia OR cancer OR carcinoma OR neoplasia OR detection OR diagnosis

((Upper gastrointestinal endoscopy[Title/Abstract]) AND (photos[Title/Abstract] OR pictures[Title/Abstract]) AND (Diagnostic yield[Title/Abstract] OR Dysplasia[Title/Abstract] OR cancer[Title/Abstract] OR carcinoma[Title/Abstract] OR neoplasia[Title/Abstract] OR detection[Title/Abstract] OR diagnosis[Title/Abstract])) AND (("2015/01/01"[Date - Publication] : "2023/12/31"[Date - Publication]))

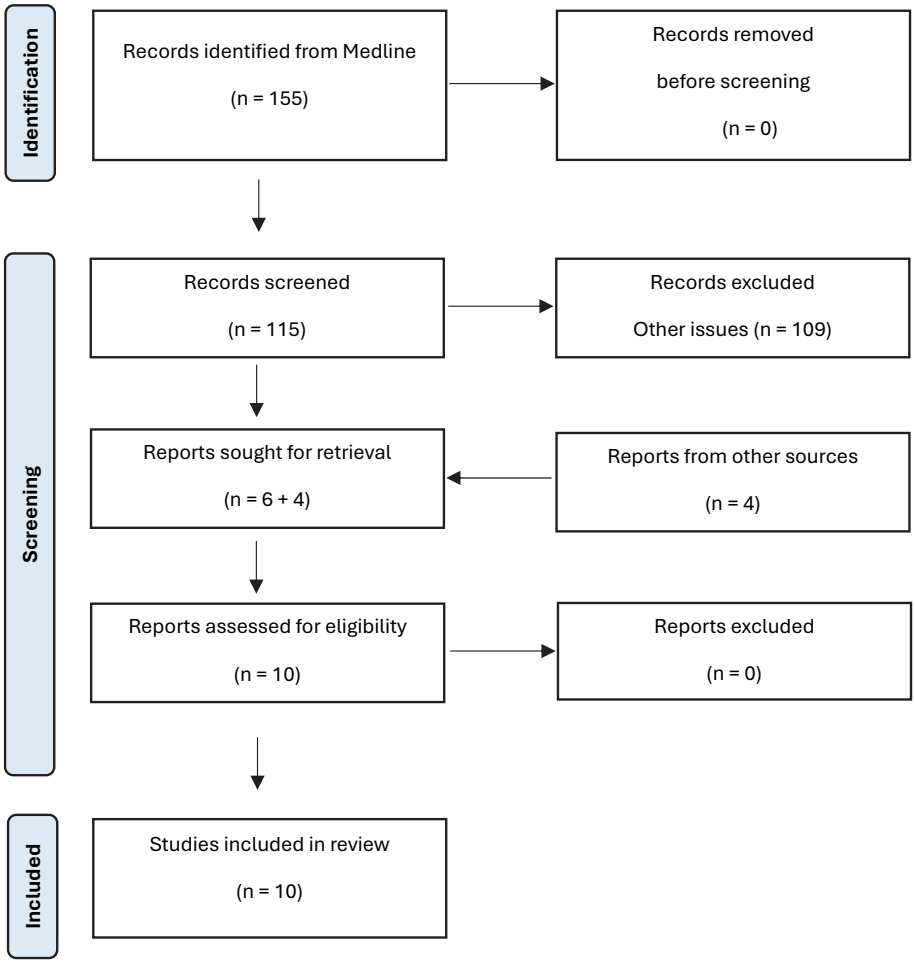
3 results



PICO nº 7: Examination time
P: Patients scheduled for upper gastrointestinal endoscopy
I: more time
C: less time
O: Diagnostic yield OR Dysplasia OR cancer OR carcinoma OR neoplasia OR detection OR diagnosis

((Upper gastrointestinal endoscopy[Title/Abstract]) AND (time[Title/Abstract]) AND (Diagnostic yield[Title/Abstract] OR Dysplasia[Title/Abstract] OR cancer[Title/Abstract] OR carcinoma[Title/Abstract] OR neoplasia[Title/Abstract] OR detection[Title/Abstract] OR diagnosis[Title/Abstract])) AND (("2015/01/01"[Date - Publication] : "2023/12/31"[Date - Publication]))

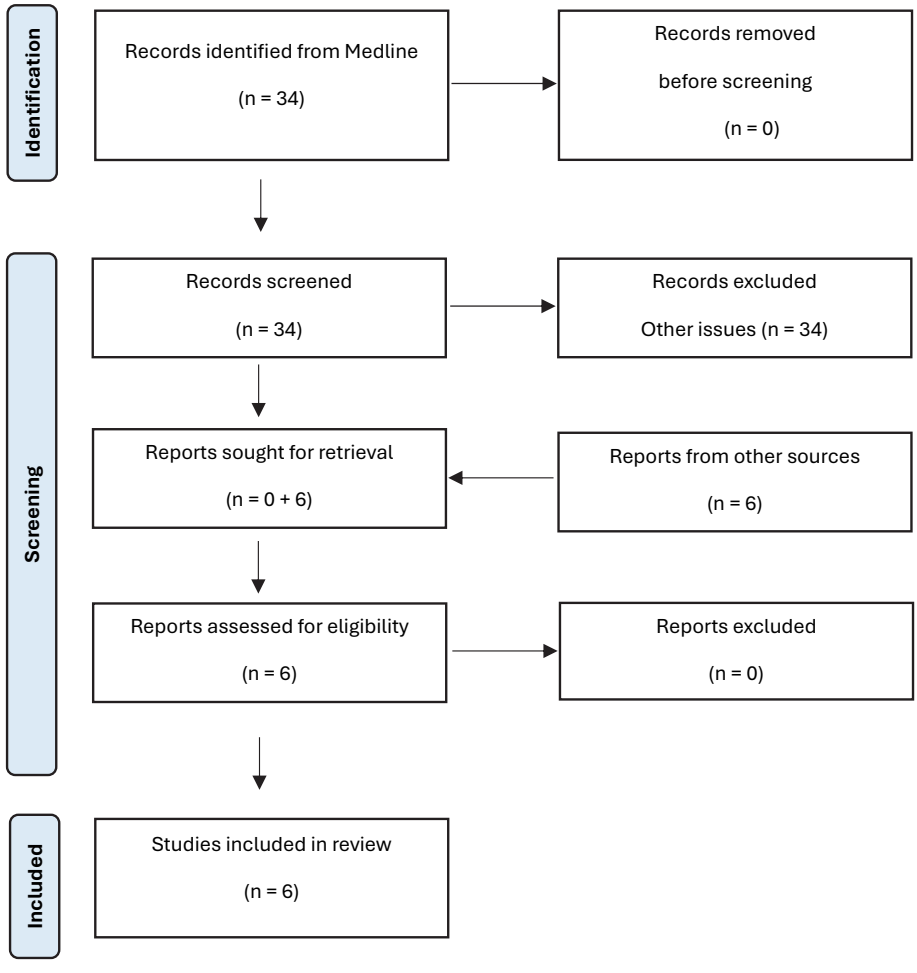
115 results



PICO nº 8: Standardized terminology
P: Patients scheduled for upper gastrointestinal endoscopy
I: Standardized reporting OR classification
C: No Standardized reporting OR classification
O: Diagnostic yield OR Dysplasia OR cancer OR carcinoma OR neoplasia OR detection OR diagnosis

((Upper gastrointestinal endoscopy[Title/Abstract]) AND (Standardized reporting[Title/Abstract] OR classification[Title/Abstract]) AND (Diagnostic yield[Title/Abstract] OR Dysplasia[Title/Abstract] OR cancer[Title/Abstract] OR carcinoma[Title/Abstract] OR neoplasia[Title/Abstract] OR detection[Title/Abstract] OR diagnosis[Title/Abstract])) AND (("2015/01/01"[Date - Publication] : "2023/12/31"[Date - Publication]))

34 results



PICO nº 9: Observation time in Barrett
P: Patients scheduled for Barrett surveillance endoscopy
I: More inspection time
C: Less inspection time
O: Dysplasia OR cancer OR carcinoma OR neoplasia OR detection OR diagnosis

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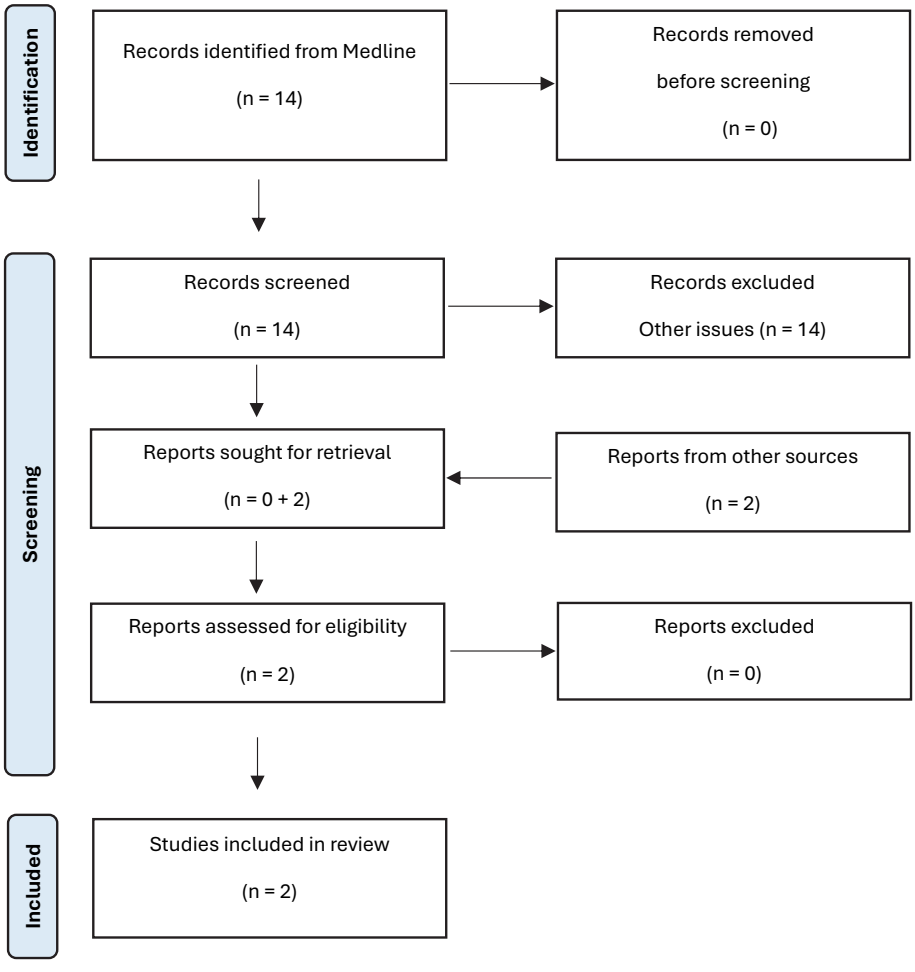
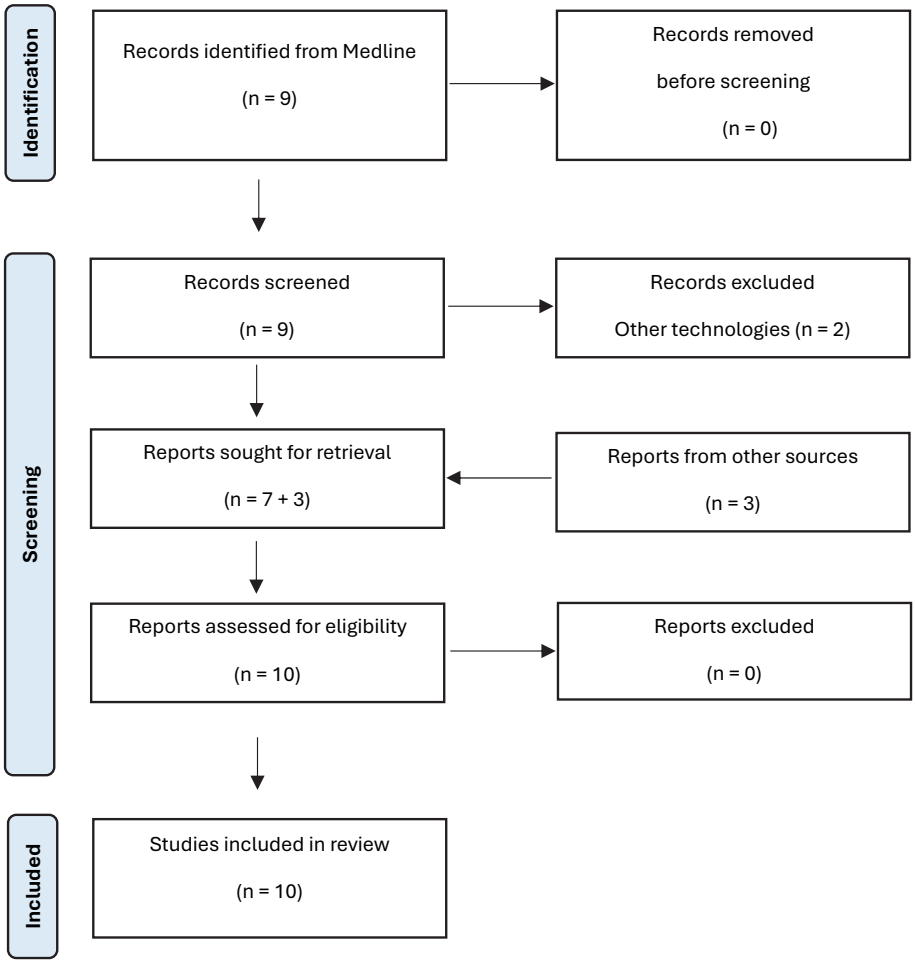
14 results



PICO nº 10: Chromoendoscopy in Barrett
P: Patients scheduled for Barrett surveillance endoscopy
I: Chromoendoscopy OR Virtual OR chromoscopy
C: No Chromoendoscopy OR Virtual OR chromoscopy
O: Dysplasia OR cancer OR carcinoma OR neoplasia OR detection OR diagnosis

((Barrett surveillance endoscopy[Title/Abstract]) AND (Chromoendoscopy[Title/Abstract] OR Virtual[Title/Abstract] OR chromoscopy[Title/Abstract]) AND (Dysplasia[Title/Abstract] OR cancer[Title/Abstract] OR carcinoma[Title/Abstract] OR neoplasia[Title/Abstract] OR detection[Title/Abstract] OR diagnosis[Title/Abstract])) AND (("2015/01/01"[Date - Publication] : "2023/12/31"[Date - Publication]))

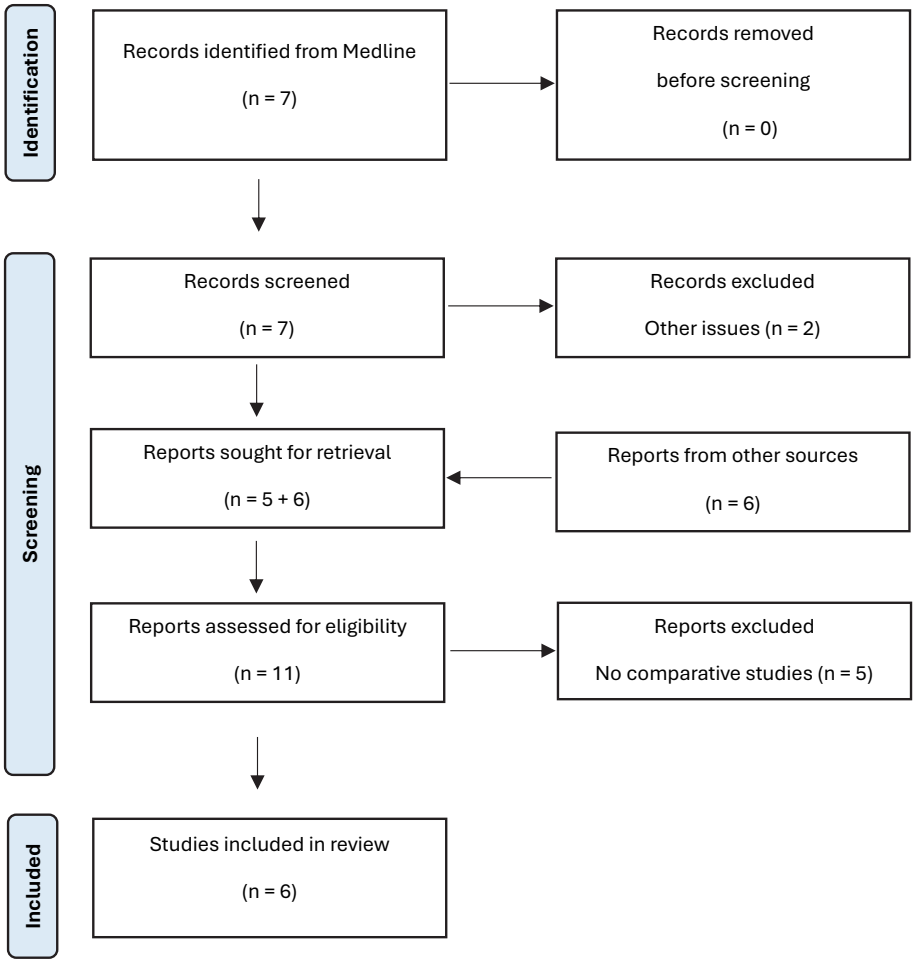
9 results



PICO nº 11: Chromoendoscopy in patients at risk for squamous cell carcinoma
P: Patients scheduled for upper gastrointestinal endoscopy AND Head OR Neck OR Squamous OR carcinoma OR Neoplasm
I: Chromoendoscopy OR Virtual OR chromoscopy
C: No Chromoendoscopy OR Virtual OR chromoscopy
O: Dysplasia OR cancer OR carcinoma OR neoplasia OR detection OR diagnosis

((Head[Title/Abstract] OR Neck[Title/Abstract] OR Squamous[Title/Abstract] OR carcinoma[Title/Abstract] OR cancer[Title/Abstract] OR neoplasm[Title/Abstract]) AND (Upper gastrointestinal endoscopy[Title/Abstract]) AND (Chromoendoscopy[Title/Abstract] OR Virtual[Title/Abstract] OR chromoscopy[Title/Abstract]) AND (Dysplasia[Title/Abstract] OR cancer[Title/Abstract] OR carcinoma[Title/Abstract] OR neoplasia[Title/Abstract] OR detection[Title/Abstract] OR diagnosis[Title/Abstract])) AND (("2015/01/01"[Date - Publication] : "2023/12/31"[Date - Publication]))

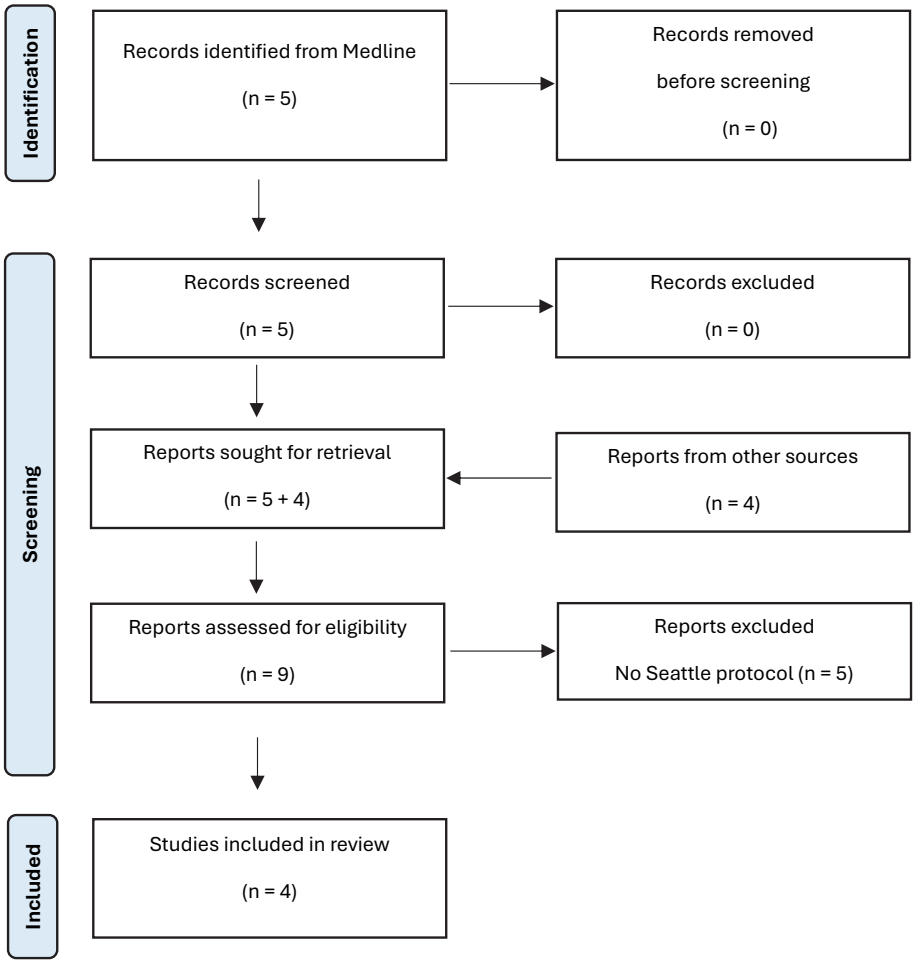
7 results



PICO nº 12: Seattle protocol for Barrett's esophagus
P: Patients scheduled for Barrett surveillance endoscopy
I: Seattle protocol
C: No Seattle protocol
O: Dysplasia OR cancer OR carcinoma OR neoplasia OR detection OR diagnosis

((Barrett surveillance endoscopy[Title/Abstract]) AND (Seattle protocol[Title/Abstract]) AND (Dysplasia[Title/Abstract] OR cancer[Title/Abstract] OR carcinoma[Title/Abstract] OR neoplasia[Title/Abstract] OR detection[Title/Abstract] OR diagnosis[Title/Abstract])) AND (("2015/01/01"[Date - Publication] : "2023/12/31"[Date - Publication]))

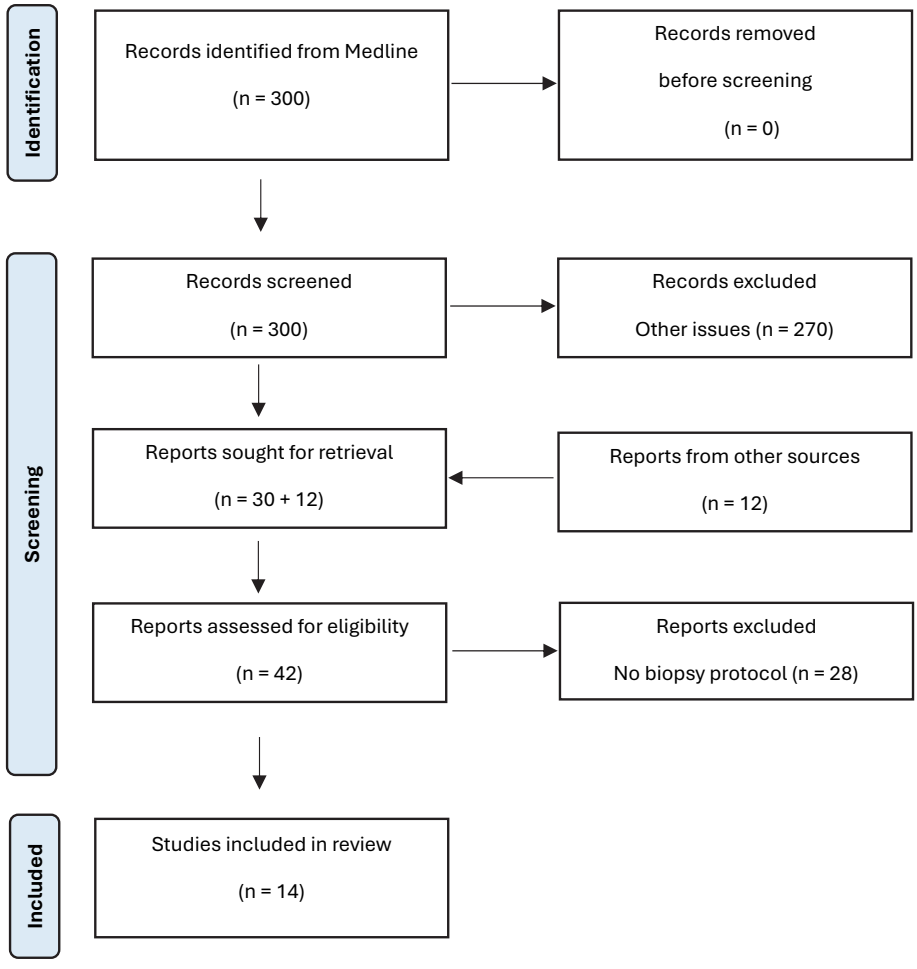
5 results



PICO nº 13: MAPS protocol for gastric precancerous assessment
P: Patients scheduled for upper gastrointestinal endoscopy OR gastroscopy
I: MAPS biopsies OR protocol
C: No biopsies OR No MAPS biopsies OR protocol
O: Intestinal metaplasia OR Dysplasia OR cancer OR carcinoma OR neoplasia OR detection OR diagnosis

((Upper gastrointestinal endoscopy[Title/Abstract] OR gastroscopy[Title/Abstract]) AND (MAPS[Title/Abstract] OR biopsies[Title/Abstract] OR protocol[Title/Abstract]) AND (Intestinal metaplasia[Title/Abstract] OR Dysplasia[Title/Abstract] OR cancer[Title/Abstract] OR carcinoma[Title/Abstract] OR neoplasia[Title/Abstract] OR detection[Title/Abstract] OR diagnosis[Title/Abstract])) AND (("2015/01/01"[Date - Publication] : "2023/12/31"[Date - Publication]))

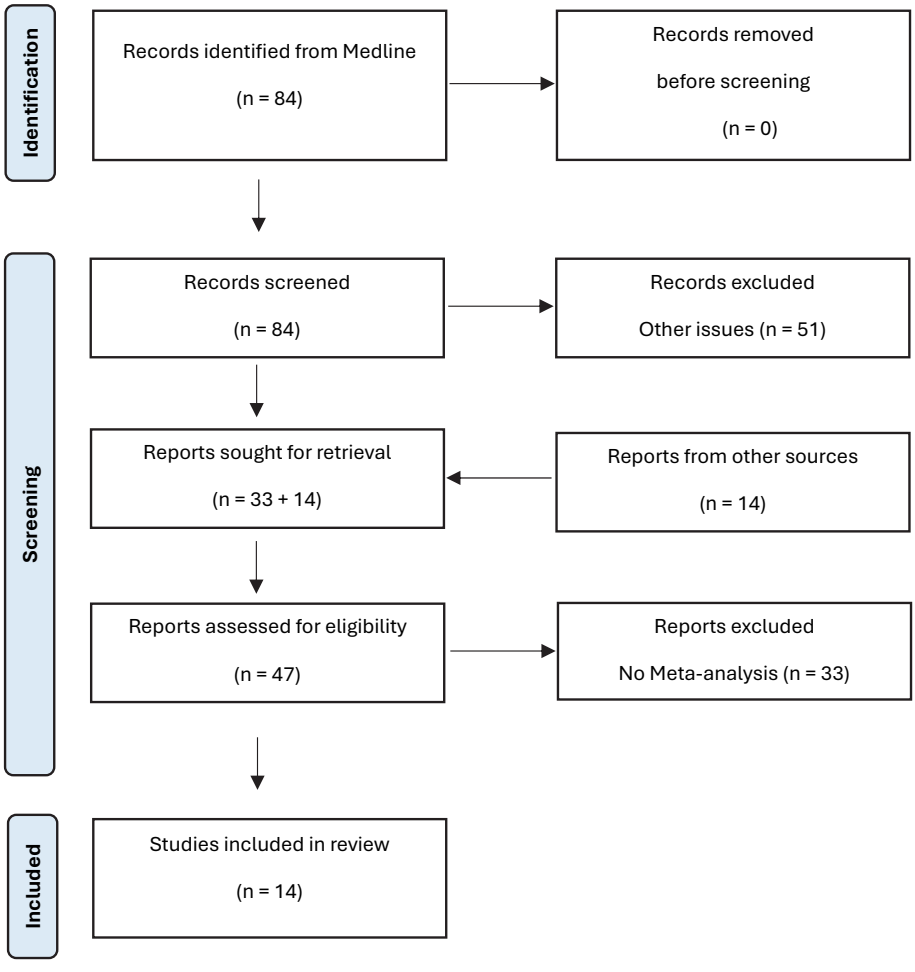
300 results



PICO nº 14: Complications after therapeutic procedures
P: Patients scheduled for upper gastrointestinal endoscopy
I: Dilatation OR Dilation OR Polypectomy OR resection OR dissection
C: none
O: Complication OR Perforation OR Bleeding OR Haemorrhage

((Upper gastrointestinal endoscopy[Title/Abstract]) AND (Dilatation[Title/Abstract] OR Dilation[Title/Abstract] OR Polypectomy[Title/Abstract] OR resection[Title/Abstract] OR dissection[Title/Abstract]) AND (Complication[Title/Abstract] OR Perforation[Title/Abstract] OR Bleeding[Title/Abstract] OR Haemorrhage[Title/Abstract])) AND (("2015/01/01"[Date - Publication] : "2023/12/31"[Date - Publication]))

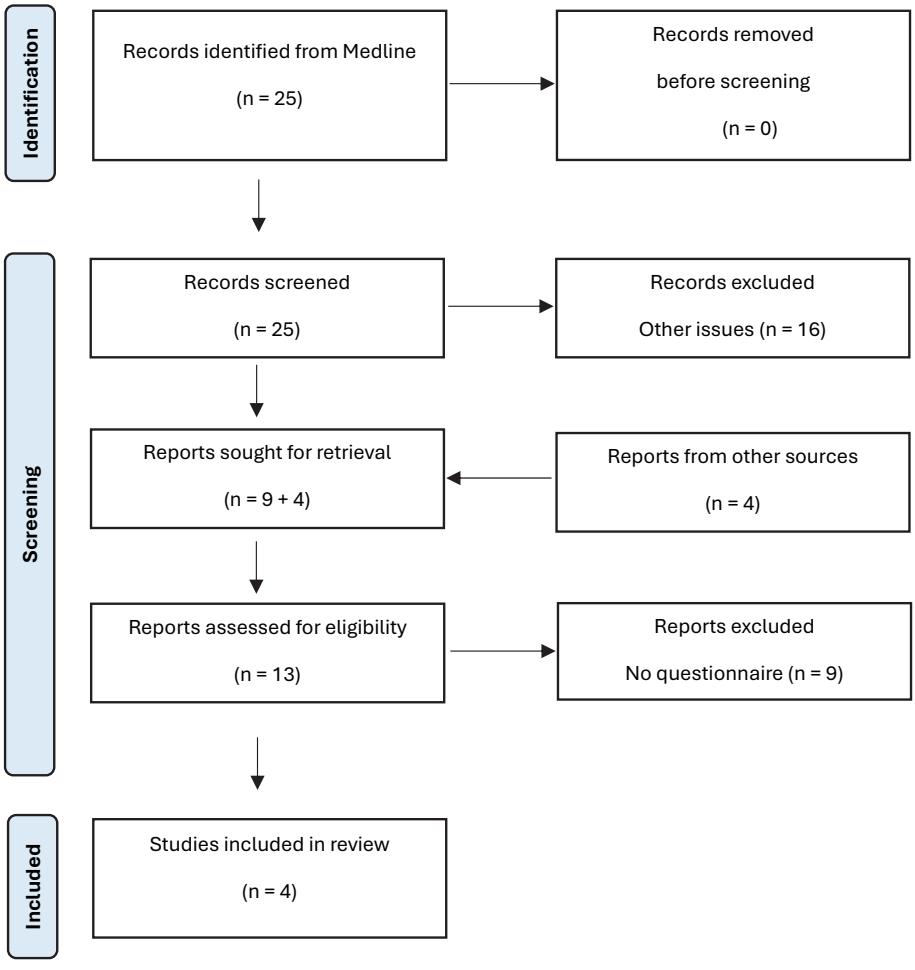
84 results



PICO nº 15: Patient's experience
P: Patients scheduled for upper gastrointestinal endoscopy
I: Measure OR evaluation OR scale OR Questionnaire
C: No Measure OR evaluation OR scale OR Questionnaire
O: Experience OR Satisfaction

((Upper gastrointestinal endoscopy[Title/Abstract]) AND (Measure[Title/Abstract] OR evaluation[Title/Abstract] OR scale[Title/Abstract] OR Questionnaire[Title/Abstract]) AND (Experience[Title/Abstract] OR Satisfaction[Title/Abstract])) AND (("2015/01/01"[Date - Publication] : "2023/12/31"[Date - Publication]))

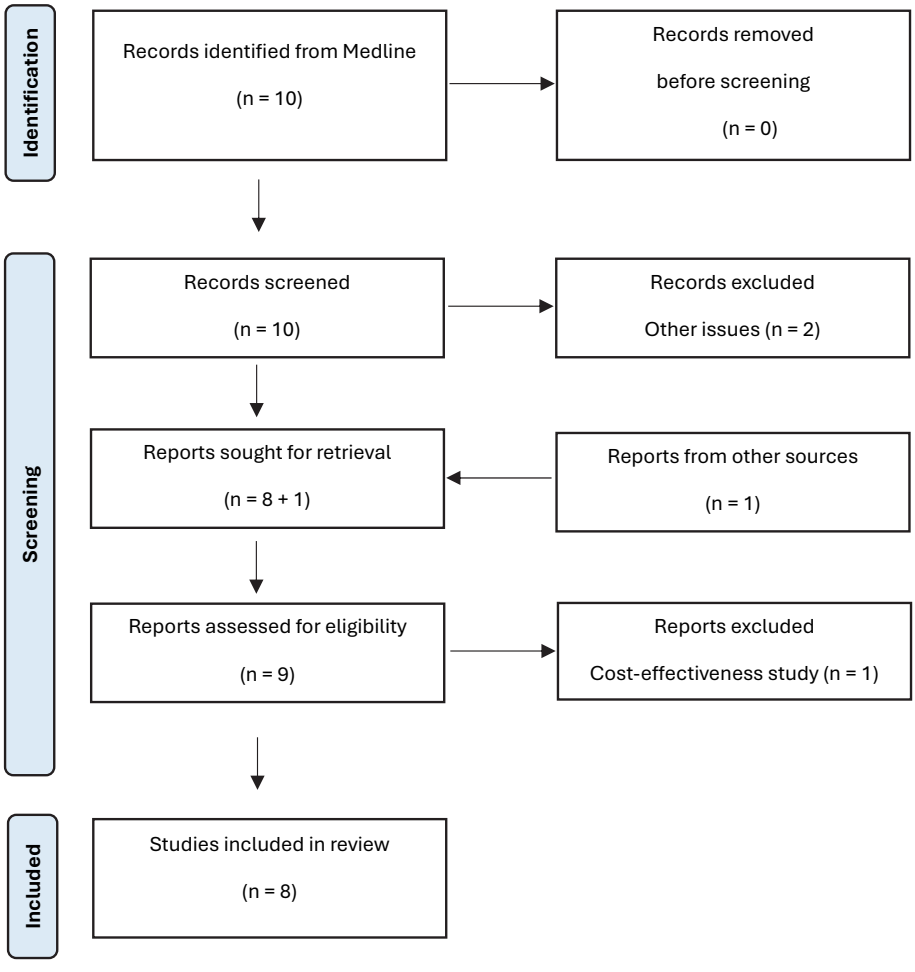
25 results



PICO nº 16: Barrett's esophagus surveillance according to guidelines
P: Patients scheduled for Barrett surveillance endoscopy
I: Registry OR Database
C: No registry OR database
O: Dysplasia OR cancer OR carcinoma OR neoplasia OR detection OR diagnosis

((Barrett surveillance endoscopy[Title/Abstract]) AND (Registry[Title/Abstract] OR Database[Title/Abstract]) AND (Dysplasia[Title/Abstract] OR cancer[Title/Abstract] OR carcinoma[Title/Abstract] OR neoplasia[Title/Abstract] OR detection[Title/Abstract] OR diagnosis[Title/Abstract])) AND (("2015/01/01"[Date - Publication] : "2023/12/31"[Date - Publication]))

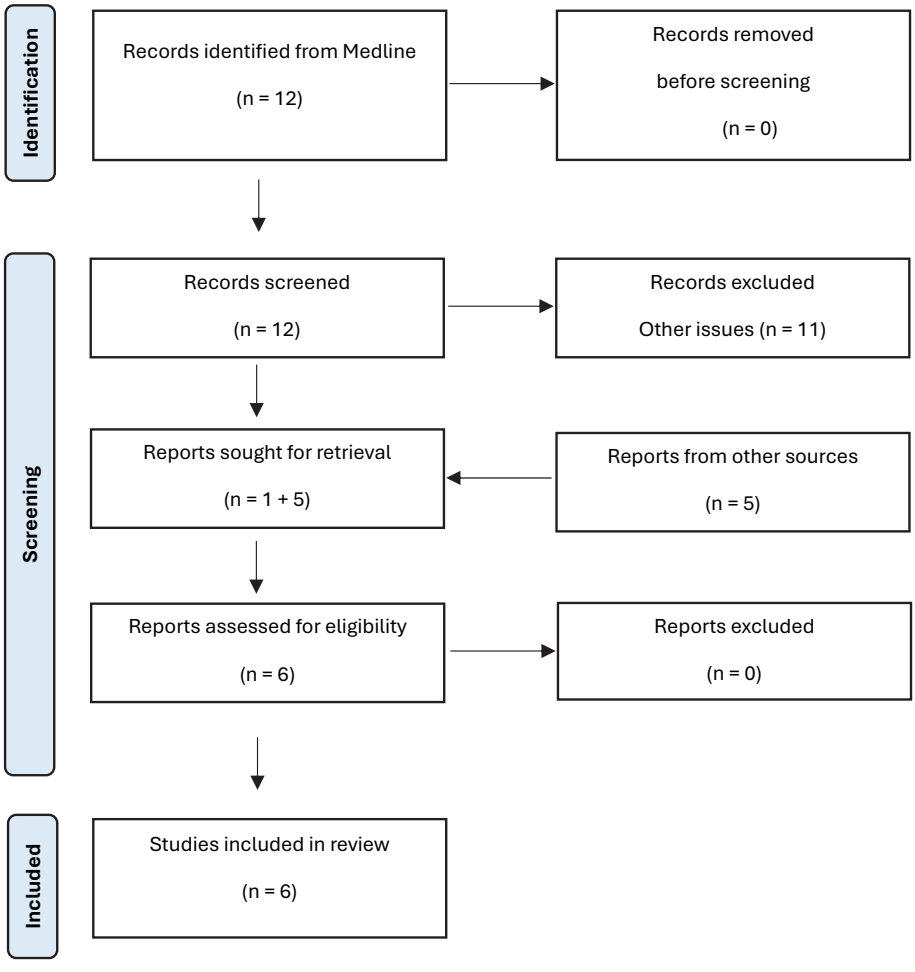
10 results



PICO nº 17: Gastric precancerous conditions surveillance according to guidelines
P: Patients scheduled for gastric precancerous conditions surveillance endoscopy
I: Registry OR Database
C: No registry OR database
O: Dysplasia OR cancer OR carcinoma OR neoplasia OR detection OR diagnosis

((Upper gastrointestinal endoscopy[Title/Abstract] OR gastroscopy[Title/Abstract]) AND (Registry[Title/Abstract] OR Database[Title/Abstract]) AND (biopsies[Title/Abstract] OR protocol[Title/Abstract]) AND (Intestinal metaplasia[Title/Abstract] OR Dysplasia[Title/Abstract] OR detection[Title/Abstract] OR diagnosis[Title/Abstract]) AND (("2015/01/01"[Date - Publication] : "2023/12/31"[Date - Publication]))

12 results



Appendix 2s Endoscopic classifications that are useful and clinically applicable, but not considered for the calculation of a quality performance measure

– Endoscopic Reference Score (EREFS) for Eosinophilic Esophagitis
– Kodsi's classification for Candida Esophagitis
– Hill's classification for the assessment of gastroesophageal flap valve
– Kimura-Takemoto classification for grading extension of gastric atrophy
– Endoscopic Grading for Gastric Intestinal Metaplasia (EGGIM) classification for grading severity and extension of intestinal metaplasia

The Endoscopic Reference Score (EREFS) for Eosinophilic Esophagitis (51.9% agreement), describes the absence or presence of oedema, exudates, furrows, strictures and crepe paper esophagus (fragility or laceration of the mucosa during exploration), and grades the severity of rings into four categories: absence, mild, moderate, and severe [1]. The latest simplification of the EREFS showed increased inter- and intra-observer agreement between trainee and expert endoscopists [2]. Although the absence of these findings does not exclude the diagnosis of eosinophilic esophagitis, the presence of any of them might allow endoscopists to suspect the disease during diagnostic endoscopy and target biopsies, especially during the following of these patients [3]. Providing a score based on the simplified EREFS score could help in the endoscopic monitoring of the disease.

The Kodsi's classification for Candida Esophagitis (14.8% agreement) estimates the severity of candidiasis in the esophagus [4]. Even after decades of publication, it was never validated, but might be applied in cases where assessing the severity of esophageal candidiasis is necessary, particularly in immunocompromised patients.

The Hill's classification for the assessment of gastroesophageal flap valve (48.2% agreement), was largely forgotten but has regained usefulness in recent years, especially with the emergence of endoscopic therapeutic techniques aimed at decreasing the esophageal reflux [5]. This classification might be considered in patients being evaluated for endoscopic techniques and to assess the success of treatment.

For the assessment of specific gastric cancer risk, there are two endoscopic classifications.

The Kimura-Takemoto classification (25.9% agreement) estimates the severity of glandular atrophy based on the location of the atrophic border [6]. A meta-analysis of Japanese studies demonstrated an association between the severity of this classification and the risk of gastric cancer, but low to moderate agreement among endoscopists has limited its spread and usefulness [7-9].

The Endoscopic Grading for Gastric Intestinal Metaplasia (EGGIM) classification (48.2% agreement) estimates the severity and extension of intestinal metaplasia using high-definition imaging and narrow-band imaging (NBI) [10-12]. The two endoscopic signs described are the presence of tubulo-regular pattern and the Light Blue Crest. In this classification, five areas should be assessed: the lesser and greater curvature of the antrum, the incisura, and the lesser and the greater curvature of the corpus. Each area should be graded into three categories: 0 (absence of intestinal metaplasia), 1 (presence of intestinal metaplasia < 30%), and 2 (presence of intestinal metaplasia > 30%). Patients with a score ≥5 are associated with an increased risk for gastric cancer.

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