

World Endoscopy Organization General Endoscopy Lexicon For Learners

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1. Abstract

1.1. Background: Physicians completing subspecialty training in gastroenterology are expected to develop competence performing general endoscopic procedures including upper endoscopy, colonoscopy, and flexible sigmoidoscopy. Recent research exploring essential teaching competencies for those involved in endoscopic education suggests usage of succinct standardized language when teaching endoscopy, but to date no one has examined the breadth of terms used or developed consensus around specific language to be used in this aspect of medical training.

1.2. Methods: 22 physicians identified as expert endoscopy educators and trainees from various countries around the world, who were members of the World Endoscopy Organization (WEO) Education Committee, were invited to participate. Multistage anonymous surveys in a modified Delphi process were used to surveyed terminology used worldwide by expert teachers of endoscopy to develop a standardized lexicon for general endoscopic education. The first survey had open ended questions allowing respondents to suggest terms. These terms were then evaluated through 3 rounds of voting. *A priori* we defined consensus as 70% agreement among respondents. *A posteriori* if a category failed to have a term reach 70%

consensus, the highest agreed upon term was reported as “suggested.”

1.3. Results: After 4 rounds of surveys, 36 recommended terms and 5 suggested terms organized into 14 categories of endoscopic maneuvers and actions commonly used in general endoscopic procedures comprise this recommended vocabulary.

1.4. Conclusion: Through use of a modified Delphi survey process, a standardized lexicon was developed that can be applied to general endoscopic education to improve communication and reduce ambiguity between educators and trainees.

2. Keywords:

endoscopy, medical education, colonoscopy, esophagogastroduodenoscopy, vocabulary

3. Introduction

Physicians completing subspecialty training in gastroenterology are expected to develop competence in performing general endoscopic procedures including upper endoscopy, colonoscopy, and flexible sigmoidoscopy [1]. Several societies, both nationally and internationally, propose various competency benchmarks and quality indicators for each endoscopic procedure in an effort to ensure that physicians are providing high-quality examinations [2-6]. Endoscopy education is often provided through a faculty-led apprenticeship model where trainees work with various endoscopists to develop skills in real-time procedures [7]. This model may result in heterogeneous training as learners may be exposed to several different proctors over time. This leads to variable education and learning both within and across institutions.

In an effort to help standardize the process of teaching and learning endoscopy, general principles in endoscopic training have been proposed by several groups [1]. In addition, several studies endorse formalized training of endoscopy educators, and some countries including Canada and the United Kingdom have introduced formal training programs for endoscopy trainers [8-10]. The United Kingdom “Train the Colonoscopy Trainer” program, for example, is a course where endoscopists participate in both didactic and hands-on learning techniques. One goal of the course is for endoscopists to have a better understanding of how skills are acquired [8]. An important part of the skill acquisition process is the development of conscious competence, a state of understanding in which a person is able to verbally deconstruct a skill. In developing a deeper understanding of this process, endoscopists can learn how to verbally instruct their trainees on what to do during endoscopic procedures, rather than assuming control of the scope to demonstrate. In addition, it is recommended that the

International Journal of Gastroenterology and Hepatology

endoscopist use language that follows the “4Cs”- clear, concise, common, and consistent [8]. Taking this one step further by having a standardized lexicon with which to use in this aspect of endoscopic training may further enhance the learning experience for the trainee. Recent research exploring essential teaching competencies for those involved in endoscopic education also suggests usage of succinct standardized language when teaching endoscopy, but to date no one has examined the breadth of terms used or developed consensus around specific terminology [1,2,7]. While recommended terms have been proposed, they have not been subjected to consensus assessment or other formal validation [11]. In this project, we surveyed terminology currently used worldwide by expert teachers of endoscopy and, through a Delphi process, developed a recommended standardized lexicon for endoscopic educators to use when training other physicians in general endoscopy.

4. Methods

We identified a cohort of physicians including expert teachers of endoscopy and physicians currently undergoing gastroenterology training to participate in this study. A total of 22 physicians identified as gastroenterology trainees and expert endoscopy educators from various countries around the world, who were members of the World Endoscopy Organization (WEO) Education Committee, were invited to participate. Background data on these participants can be seen in Table 1.

Table 1: Participant Background Data

Male	16
Professor Rank	9
Therapeutic Endoscopy Training	14
>50 publications	14

Trainees were invited to participate as they were felt to be stakeholders in this process with a valuable opinion. This study was conducted via multistage surveys in a modified Delphi process [12]. Four rounds of anonymous surveys were completed. Surveys were submitted anonymously by the participants. The first round of surveys was aimed at identifying common terms used when instructing trainees during endoscopic procedures using open ended questions. Various maneuvers and functions that might be required during a general endoscopic procedure (EGD, flexible sigmoidoscopy and colonoscopy) were identified including scope-specific manipulation and accessory manipulation. Participants were asked to submit terms that they most commonly use for these various endoscopic maneuvers. Participants were also given an opportunity in round 1 to identify if other maneuvers should be included outside of those already classified. Importantly, to avoid bias we did not send out a suggested list of terms, and all terms assessed were anonymously suggested. Once potential terms were identified, a survey was created for round 2 with the terms from round 1 organized in relation to their respective endoscopic maneuver for review. A consensus threshold of 70% was defined *a priori*

by the committee for term inclusion into the lexicon. For maneuvers containing 4 or more possible terms, participants were asked to rank the terms in an order that they felt most appropriate from most likely to least likely to use. For maneuvers with 3 or less suggested terms, participants were asked to vote for the term that they felt would be most appropriate for each category. Each participant received the same survey for each round.

For terms that did not reach a consensus threshold in round 2, a third round of surveys was created. The round 3 survey included the 2 highest ranking terms for each remaining category asked participants to choose the term they were most likely to use to instruct trainees for each maneuver. For the terms that remained under the consensus threshold, a fourth and final round of surveys was distributed asking participants to agree or disagree on whether to include a term or terms into the lexicon. Terms that achieved a 70% minimum consensus were included in the lexicon as “Recommended Terms”, as per our *a priori* threshold. Categories or actions that did not have any term reach the threshold consensus of 70% were included *a posteriori* as “Suggested Terms”. The first round of surveys was submitted via email and all data was logged anonymously. Subsequent surveys for rounds 2 through 4 were submitted anonymously through the electronic survey website, Survey Monkey (www.surveymonkey.com). No identifying data were collected. Descriptive data analysis was performed. This project was organized and supported under the auspices of the WEO Education Committee, and the manuscript was reviewed and approved by the WEO Executive Committee.

5. Results

Figure 1 depicts the various countries from which participants were invited. The proposed standardized general endoscopy lexicon for learners is included in Table 2. After 4 rounds of surveys, 36 recommended terms and 5 suggested terms organized into 14 categories of endoscopic maneuvers and actions commonly used in general endoscopic procedures comprise this recommended vocabulary.

Figure 1



International Journal of Gastroenterology and Hepatology

World map identifying the various countries from which participants were invited to participate in this study.

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Table 2: General Endoscopy Lexicon

Endoscopy Instruction	Committee Consensus (%)	Final Stance
Scope Manipulation		
Rotate (torque) clockwise/ counterclockwise	100*	Recommended
Rotate (torque) right/left		
Big wheel/dial up	94.42	Recommended
Big wheel/dial down	88.9	Recommended
Little wheel/dial up	88.9	Recommended
Little wheel/dial down	88.89	Recommended
Advance scope	77.78	Recommended
Pull scope Back	100%	Recommended
Brush Manipulation		
Put brush out Advance brush	100%*	Recommended
Pull brush in Withdraw brush	83.33*	Recommended
Brush tissues	56.25	Suggested
Clip Manipulation		
Open clip	93.75	Recommended
Close clip	81.25	Recommended
Rotate clip	87.5	Recommended
Deploy clip Fire clip	91.67*	Recommended
Cautery - Monopolar, Bipolar – Manipulation		
Advance cautery probe	75	Recommended
Start cautery Cut/coagulate	58.33*	Suggested
Forceps Manipulation		
Advance forceps	91.67	Recommended
Open forceps	93.75	Recommended
Close forceps	81.25	Recommended
Withdraw forceps	100	Recommended
Pictures/Video		
Take a picture/video	77.78	Recommended
Air (blue button)		

Insufflate	72.22	Recommended
Water (blue button)		
Clean your lens	88.89	Recommended
Suction (red button)		
Suction	77.78	Recommended
Through the Scope Balloon Dilator Manipulation		
Advance dilator	56.25	Suggested
Inflate balloon	100	Recommended
Deflate balloon	56.25	Suggested
Bougie Dilator Manipulation		
Advance wire	81.25	Recommended
Advance dilator over wire	87.5	Recommended
Net Manipulation		
Open net	93.75	Recommended
Close net	93.75	Recommended
Use of Electrocautery Pedals (blue, yellow)		
Blue pedal	81.25	Recommended
Yellow pedal	81.25	Recommended
Snare Manipulation		
Open snare	93.75	Recommended
Close snare	93.75	Recommended
Cut	56.25	Suggested

*The committee consensus to include both terms in the lexicon.

Round 1

The first round of surveys was used to create a list of potential terms to be considered for inclusion in the lexicon. This first survey was distributed to participants asking for free-response suggestions to identify common endoscopic maneuvers and associated terms commonly used to describe these maneuvers performed during standard upper and lower endoscopy. These items appeared as open-ended prompts for participants to answer. Participants could list as many terms or maneuvers as they felt were applicable. Ultimately, 17 endoscopic maneuvers and actions were identified with 76 potential terms submitted for consideration. A total of 19 participants provided responses for round 1 (86% response rate).

Round 2

In round 2, terms for 6 maneuvers had reached the consensus threshold of 70%. Of the 17 questions included in this round 2 survey, 8 questions were answered by 18 participants and the remaining 9 questions answered

International Journal of Gastroenterology and Hepatology

by 16 participants (73% to 82% response rate).

Round 3

In round 3, terms for 11 maneuvers were evaluated. A total of 16 physicians participated in this round, completing all survey questions available (73% response rate). Four terms reached consensus threshold during this round. Following this 3rd round of surveys, a virtual meeting was held between the participants to review and discuss 7 remaining categories with terms that had not yet achieved consensus within the group. The decision to include multiple standardized term options for certain maneuvers was made, and a fourth round of surveys was distributed to obtain formal committee consensus on this decision.

Round 4

Terms for 7 maneuvers were voted on during the fourth and final round of this Delphi process. This round of surveys focused on inclusion of 2 term options per maneuver that had not previously achieved consensus in prior rounds. 12 participants completed this round (55% response rate).

6. Discussion

The use of standardized language can be seen in various areas of healthcare as several medical professions have adopted uniform verbiage as it pertains to their specialty [13-16]. There are many benefits of a consistent vocabulary including facilitation of clear communication, accurate classification and clinical documentation of patient problems and interventions, and improved patient care [17]. By using the same verbiage, patient care can better transition across healthcare providers and institutions since everyone is speaking the same language. We anticipate similar benefits of implementing a standardized educational lexicon for endoscopic education. Currently, endoscopic education is commonly achieved through faculty-led education in an apprenticeship model in which the physician trainee learns through hands-on training under an accomplished endoscopist. This is an educational model with inherent heterogeneity as instruction and verbiage used to train physicians are specific to the institution and educators for that training program and are not necessarily consistent. Several endoscopic educational and quality standards have already been set in place to help define what skills are needed for competency, and guidelines are now recommending that standardized language also be instituted to streamline endoscopic education as a best practice [7,9].

Learning endoscopy effectively requires attentive trainers who can provide articulate technical instruction and constructive feedback to trainees. Being able to verbally deconstruct and direct a trainee in how to maneuver a scope to resolve challenges throughout endoscopic procedures is ideal as this provides experiential learning for the trainee. Without this experience, trainees may have a more difficult time navigating challenging procedures when they graduate to independent practice. However, we know that just because an endoscopist is deemed competent or has excellent performance does not mean that this will translate to effective teaching. This is the basis

for the development and institution of several "Train the Trainer" courses throughout several countries around the world. As part of the curricula, many of these courses often employ standard endoscopy verbiage to help simplify instruction and reduce the potential for cognitive overload, especially in novice trainees [18]. Importantly, implementation of these courses has been correlated with improved endoscopy outcomes [8]. Through this international modified Delphi survey of expert endoscopy educators, consensus was reached on a standardized general endoscopy lexicon for learners. This lexicon includes 36 recommended terms and 5 suggested terms organized into 14 categories of endoscopic maneuvers and actions commonly used in general endoscopic procedures. The use of consistent verbiage among endoscopists who are involved in teaching can help reduce ambiguity for learners and streamline the educational process across proctors [19]. In addition to improved communication, the use of standardized language has been shown to have several other benefits in other areas of healthcare including improvements in quality of patient care and knowledge generation, and these advantages are likely applicable to endoscopic education as well [15, 20]. Our study has many strengths. Because our study participants were from international backgrounds, this lexicon is applicable to trainees throughout the world. In addition, this is the first standardized lexicon that has been created through a formal modified Delphi process for use in endoscopic education, addressing an educational gap that has been previously identified by several groups. Other lists of terms have been proposed, but none have been developed through a consensus-based process or otherwise validated, and may have only a limited list that does not, for example, include accessory manipulation [11]. Finally, this is a comprehensive lexicon that provides language for many maneuvers that might be performed during a general endoscopic exam beyond just scope manipulation.

Limitations of the study include a lower response rate of 55% for the final round of the Delphi process. While the authors do not believe this to have had a significant impact on the final results, we acknowledge the possibility that this could have impacted the study. Every effort was made to encourage participation and completion of all rounds of the survey. It is unclear why there was a drop in participation though survey fatigue may be one explanation. This lexicon is also limited to English instruction, and translation into other languages should be validated. We recognize that this lexicon comprises a limited, minimal set of terms, and that endoscopic teachers may wish to adapt and expand on it for their learners. Future efforts should be aimed at refining and expanding the lexicon as needed, developing additional lexicons for advanced procedures such as endoscopic retrograde cholangiopancreatography (ERCP), endoscopic ultrasound (EUS), and endoscopic submucosal dissection (ESD), and validating which terms are best (not just a consensus choice).

7. Conclusion

Research and exploration of best practices for endoscopic education have identified the need for use of a consistent language while instructing learners in general endoscopic procedures. Through use of a modified

International Journal of Gastroenterology and Hepatology

Delphi technique, we developed a standardized lexicon that can be applied to endoscopic education in an effort to improve communication and reduce ambiguity between educators and trainees.

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