

# Developing a tool to preserve eye contact with patients undergoing colonoscopy for pain monitoring

Yaron Niv

Yossi Tal

Department of Gastroenterology,  
Rabin Medical Center, Tel Aviv  
University, Israel

**Abstract:** Colonoscopy has become the leading procedure for early detection and prevention of colorectal cancer. Patients' experience of colonic endoscopic procedures is scarcely reported, even though it is considered a major factor in colorectal cancer screening participation. Pain due to air inflation or stretching the colon with an endoscope is not rare during examination and may be the main obstacle to cooperation and participation in a screening program. We propose a four-stage study for developing a tool dedicated to pain monitoring during colonoscopy, as follows: (1) comparison of patient, nurse, and endoscopist questionnaire responses about patient pain and technical details of the procedure using the PAINAD tool during colonoscopy; (2) observation of the correlation between patients' facial expressions and other parameters (using the short PAINAD); (3) development of a device for continuous monitoring of the patient's facial expression during the procedure; (4) assessment of the usability of such a tool and its contribution to the outcomes of colonoscopy procedures. Early intervention by the staff performing the procedure, in reaction to alerts encoded by this tool, may prevent adverse events during the procedure.

**Keywords:** pain scoring, colonoscopy, pain monitoring, facial expression

## Introduction

Colonoscopy has become the leading procedure for early detection and prevention of colorectal cancer.<sup>1</sup> This procedure has the highest diagnostic yield for polyps and cancer and has the advantage of being able to remove polyps and take biopsies. However, colonoscopy is an invasive procedure and in most cases sedation is used for prevention of pain and discomfort. During colonoscopy, air is insufflated, the colon is distended, and sometimes it is not easy to advance the tip of the colonoscope over curves. The patient's vital signs are closely monitored during the procedure, yet patient pain and discomfort are not.

## Pain during colonoscopy

Patients' experience of colonic endoscopic procedures is scarcely reported, even though it is considered a major factor in colorectal cancer screening participation. Pain due to air inflation or stretching the colon with the endoscope is not rare during examination and may be the main obstacle to cooperation and participation in a screening program. In addition, pain may be a significant cause for an incomplete examination and missing a lesion. Using a visual analog scale (VAS), Blom et al found that 19% of the participants in a flexible sigmoidoscopy screening program reported significant pain and 27% reported distention.<sup>2</sup> Ramakrishnan et al investigated 426 colonoscopies using

Correspondence: Yaron Niv  
Rabin Medical Center, 39 Jabotinski  
Street, Petach Tikva, 49100, Israel  
Tel +972 3 937 7237  
Fax +972 3 972 1313  
Email nivyaron80@gmail.com

a VAS to assess remembered pain shortly before discharge, and compared these scores with assessment by the endoscopist and attending nurse.<sup>3</sup> They found that nurses were more accurate than endoscopists in grading the pain of colonoscopy, perhaps because they were focused on the patient, while the endoscopists were focused on the video monitor. The VAS was validated as being more sensitive than other rating scales, although it can only be used as a research tool after the procedure.<sup>4</sup> Thus, a tool to detect patients' pain during endoscopic procedures should be developed. This approach will enable interference for pain reduction by certain maneuvers such as air sucking, loop straightening, or by adding medication. Many interventions during colonoscopy have been used to try to relieve pain and make the procedure more convenient, but an effective, validated tool to detect, monitor, and measure pain during the procedure is still lacking.<sup>5</sup>

### Pain monitoring in sedated patients

Observational tools have been described for assessing pain in sedated, noncomparative, and dementia patients.<sup>6-8</sup> We identified five different pain assessment tools that have been used with unconscious or sedated intensive-care patients. All five instruments included behavioral indicators and three included physiological indicators. Their psychometric properties varied and it was not possible to deduce their clinical utility.<sup>6</sup> These tools enable online management of patient pain during a procedure or while hospitalized and ventilated in the intensive-care unit.

PAINAD is a five-item observational tool, describing five domains:<sup>6</sup>

1. Breathing, expressed as normal (0) versus labored (1), noisy labored or long periods of Cheyne–Stokes respiration (2).
2. Negative vocalization, expressed as none (0) versus occasional moans or muttering (1), repeated troubled calling out, or loud moaning or crying (2).
3. Facial expression, expressed as smiling or inexpressive (0) versus sad, by frowning (1) or facial grimacing (2).
4. Body language, expressed as relaxed (0) versus tense and pacing (1), rigid with fists clenched, or striking out (2).
5. Consolability, expressed as no need to be consoled (0) versus able to be distracted or reassured (1) versus unable to be distracted or consoled (2).

The range of the scale is of 0 (absence of pain) to 10 (severe pain) and each domain is evaluated with an index of severity, that is: 0 = none, 1 = slight (occasional) or 2 = severe.

### Development of a pain monitoring tool for colonoscopy

We propose a four-stage study for developing a tool dedicated to pain monitoring during colonoscopy, as follows: (1) comparison of patient, nurse, and endoscopist questionnaire responses about patient pain and technical details of the procedure using the PAINAD tool during colonoscopy; (2) observation of the correlation between patients' facial expressions and other parameters (using the short PAINAD); (3) development of a device for continuous monitoring of the patient's facial expression during the procedure; (4) assessment of the usability of such a tool and its contribution to the outcomes of colonoscopy procedures. Completing these stages will enable the use of the new tool while performing colonoscopy, monitoring patient pain more efficiently.

### Study patients

The proposed study patients should be consecutive high- or average-risk people, men and women, scheduled for colorectal cancer screening with colonoscopy, and aged 50 to 75 years old.

Potential participants should be excluded if they are younger than 50 or older than 75 years old and/or have gastrointestinal symptoms, a background of severe diseases (ischemic heart disease, chronic obstructive lung disease, chronic renal failure), or have had a major operation of the gastrointestinal tract.

### Pain assessment methods

Every 5 minutes, a special study nurse will assess pain during colonoscopy, according to PAINAD. A video will be taken of the patient during the examination and PAINAD will be assessed again after the examination. The endoscopy nurse and the endoscopist will both complete a pain VAS questionnaire immediately after the procedure and the patient will also complete a pain VAS questionnaire prior to being released home. During the procedure, the endoscopist will dictate the status and any event (blowing air, sucking air, loop straightening, etc) every 5 minutes (detailed on a procedure flow chart). When a polyp is snared or there is any intervention, this will be computed in the procedure flow chart.

All pain assessment methods will be compared using *k*-statistics.

If a good correlation is found between these methods, PAINAD would be established as an ongoing pain assessment method and a feedback intervention of the team (endoscopist and colonoscopy nurse) would be established. Increased pain

score will dictate intervention such as air sucking, loop straightening, or the addition of medication.

## Conclusion

The importance of eye contact between the nurse, the physician performing the colonoscopy, and the patient is of utmost importance, since observing the patient's behavior and body language during an invasive procedure may provide important information about their physical and psychological status. This approach is especially important during procedures with potential complications and adverse events; perforation, bleeding, and cardio-respiratory side effects (sedation dependent) have all been described during colonoscopy.<sup>9</sup> Since most of the procedures are performed in healthy people for screening purposes, a special effort should be made to prevent complications.

The patient's awareness of having their reactions followed up and monitored may decrease the stress associated with undergoing colonoscopy and thus increase their cooperation and trust, resulting in better procedure outcomes.

We propose developing a tool for closely monitoring the patient's facial appearance during colonoscopy. Early intervention by the performing staff, reacting to alerts encoded by this tool, may prevent adverse events during the procedure and result in better procedure outcomes.

## Disclosure

The authors report no conflicts of interest in this work.

## References

1. Levin B, Lieberman DA, McFarland B, et al; American Cancer Society Colorectal Cancer Advisory Group; US Multi-Society Task Force; American College of Radiology Colon Cancer Committee. Screening and surveillance for the early detection of colorectal cancer and adenomatous polyps, 2008: a joint guideline from the American Cancer Society, the US Multi-Society Task Force on Colorectal Cancer, and the American College of Radiology. *Gastroenterology*. 2008;134(5):1570–1595.
2. Blom J, Lidén A, Nilsson J, Pählman L, Nyrén O, Holmberg L. Colorectal cancer screening with flexible sigmoidoscopy – participants' experiences and technical feasibility. *Eur J Surg Oncol*. 2004;30(4):362–369.
3. Ramakrishnan S, Yiannakou JY, Ellis WR, Bain IM. Assessment of patient pain at colonoscopy: are nurses better than endoscopists? *J R Soc Med*. 2004;97(9):432–433.
4. Skovlund E, Brethauer M, Grotmol T, Larsen IK, Hoff G. Sensitivity of pain rating scales in an endoscopy trial. *Clin J Pain*. 2005;21(4):292–296.
5. Leung FW. Methods of reducing discomfort during colonoscopy. *Dig Dis Sci*. 2008;53(6):1462–1467.
6. Pudas-Tähkä SM, Axelin A, Aantaa R, Lund V, Salanterä S. Pain assessment tools for unconscious or sedated intensive care patients: a systematic review. *J Adv Nurs*. 2008;65(5):946–956.
7. Costardi D, Rozzini L, Costanzi C, et al. The Italian version of the pain assessment in advanced dementia (PAINAD) scale. *Arch Geron Geriatr*. 2007;44(2):175–180.
8. Mateo O, Krenzischek D. A pilot study to assess the relationship between behavioral manifestations and self-report of pain in postanesthesia care unit patients. *J Post Anesth Nurs*. 1992;7(1):15–21.
9. Warren JL, Klabunde CN, Mariotto AB, et al. Adverse events after outpatient colonoscopy in the Medicare population. *Ann Intern Med*. 2009;150(12):849–857.

### Drug, Healthcare and Patient Safety

### Publish your work in this journal

Drug, Healthcare and Patient Safety is an international, peer-reviewed open-access journal exploring patient safety issues in the healthcare continuum from diagnostic and screening interventions through to treatment, drug therapy and surgery. The journal is characterized by the rapid reporting of reviews, original research, clinical, epidemiological and

Submit your manuscript here: <http://www.dovepress.com/drug-healthcare-and-patient-safety-journal>

Dovepress

post-marketing surveillance studies, risk management, health literacy and educational programs across all areas of healthcare delivery. The manuscript management system is completely online and includes a very quick and fair peer-review system. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.