

# Are we ready for the ERAS protocol in colorectal surgery?

Michał Kisielewski, Mateusz Rubinkiewicz, Michał Pędziwiatr, Magdalena Pisarska, Marcin Migaczewski, Marcin Dembiński, Piotr Major, Kazimierz Rembiasz, Andrzej Budzyński

Second Department of General Surgery, Jagiellonian University Medical College, Krakow, Poland

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## Abstract

**Introduction:** Modern perioperative care principles in elective colorectal surgery have already been established by international surgical authorities. Nevertheless, barriers to the introduction of routine evidence-based clinical care and changing dogmas still exist. One of the factors is the surgeon.

**Aim:** To assess perioperative care trends in elective colorectal surgery among general surgery consultants in surgical departments in Malopolska Voivodeship, Poland.

**Material and methods:** An anonymous standardized 20-question questionnaire was developed based on ERAS principles and sent out to Malopolska Voivodeship general surgery departments. Answers of general surgery consultants showed the level of acceptance of elements of perioperative care.

**Results:** The overall response rate was 66%. Several elements (antibiotic and antithrombotic prophylaxis, postoperative oxygen therapy, no nasogastric tubes) had quite a high acceptance rate. On the other hand, most crucial surgical perioperative elements (lack of mechanical bowel preparation, preoperative oral carbohydrate loading, use of laparoscopy and lack of drains, early fluid and oral diet intake, early mobilization) were not followed according to evidence-based ERAS protocol recommendations. Surgeons were not willing to change their practice, but were supportive of changes in anesthesiologist-dependent elements of perioperative care, such as restrictive fluid therapy, use of transversus abdominis plane blocks, etc.

**Conclusions:** Many elements of perioperative care in elective colorectal surgery in Malopolska Voivodeship are still dictated by dogma and are not evidence-based. The level of acceptance of many important ERAS protocol elements is low. Surgeons are ready to accept only changes that do not interfere with their practice.

**Key words:** surgeons, perioperative management, Polish survey, laparoscopic colorectal surgery.

## Introduction

Modern evidence-based perioperative care principles in elective colorectal surgery have already been established by international surgical authorities [1, 2]. The main ideas include optimization of the patient's preoperative state, use of minimally invasive surgical techniques, balanced intravenous fluid therapy, multimodal non-opioid analgesia, and early mobilization and nutrition [3, 4]. These and other elements work in synergy and aim at reduction of sur-

gically induced physiological and metabolic stress. Therefore patients experience fewer perioperative complications, and the length of hospital stay (LOS) is significantly shorter without a negative impact on the readmission rate [5, 6]. This can be applied in various branches of surgery [7–9]. Guidelines for perioperative care in elective colonic/rectal surgery included in Enhanced Recovery After Surgery (ERAS) Society recommendations are widely available [1, 2]. Nevertheless, barriers to the introduction of routine

### Address for correspondence

Michał Kisielewski MD, Second Department of General Surgery, Jagiellonian University Medical College, 21 Kopernika St, 31-501 Krakow, Poland, phone: +48 889 767 589, e-mail: [kisialeuskim@gmail.com](mailto:kisialeuskim@gmail.com)

evidence-based clinical care and changing dogmas still exist. Among potential factors that can impair implementation of the ERAS protocol are staff-related problems [10, 11].

### Aim

The aim of the study was to assess perioperative care trends in elective colorectal surgery among general surgery consultants in surgical departments in Malopolska Voivodeship, Poland, where colorectal procedures are routinely performed.

### Material and methods

A questionnaire study was conducted in the period between January and May 2016. An anonymous standardized questionnaire was developed based on ERAS principles and included 20 questions – 14 closed questions with two options to choose, and 6 open questions, where respondents could put in a number, representing for instance length of antibiotic administration (Table I). Questionnaires were approved and supported by Malopolska Voivodeship Chief Consultant in General Surgery, and distributed by mail among all surgical departments in Malopolska Voivodeship in Poland. Only general surgery consultants were asked to participate in the study. Filled out questionnaires were sent back to the authors and then analyzed. To maximize the response to the postal questionnaire a reminder letter was sent to the surgical departments that had a poor feedback rate.

During analysis of acceptance of perioperative care elements, > 75% was chosen as a level of high acceptance.

### Results

Two hundred and forty-eight questionnaires were sent out; 164 filled in versions from 25 out of 32 surgical departments from Malopolska Voivodeship were received back and then analyzed (overall response rate 66%). Depending on level of acceptance, all perioperative elements from questionnaire were divided into two groups – group 1 consisted of elements with a high level of acceptance and group 2 included poorly accepted elements (Table II).

Nearly 87% of surgeons do discuss individually with their patients what the convalescence period will be like. Ninety-six percent of patients will receive antithrombotic and antibiotic prophylaxis, and antibiotics would not be continued postoperatively in 28% of cases (mean length of antibiotic administration 2.06 days, range: 0–7 days). In 80% of patients restricted perioperative intravenous fluid therapy will be used. In 84% of cases the nasogastric tube will be removed shortly after surgery. Postoperative pain management is based on opioid drugs in 73% of patients, and in 78% of cases additional locoregional anesthetic techniques would be used. Seventy-nine percent of patients would receive postoperative oxygen therapy.

Thirty percent of surgeons do not use mechanical bowel preparation in colonic surgery, and 20%

**Table I.** Elements of perioperative care covered in standardized questionnaire

1. Preoperative patient education	Y/N <sup>^</sup>	11. Routine use of drains	Y/N
2. Mechanical bowel preparation in colon surgery	Y/N	12. <i>Length of peritoneal drainage</i>	
3. Mechanical bowel preparation in rectal surgery	Y/N	13. Opioid drug use	Y/N
4. Preoperative oral carbohydrate loading	Y/N	14. Use of locoregional analgesia techniques (TAP block, epidural analgesia)	Y/N
5. Antithrombotic prophylaxis	Y/N	15. Postoperative nausea and vomiting prophylaxis use	Y/N
6. Antibiotic prophylaxis	Y/N	16. Postoperative oxygenation	Y/N
7. <i>Length of perioperative antibiotics administration</i>		17. <i>Day of oral fluids introduction</i>	
8. Open or laparoscopic surgical approach preferred		18. <i>Day of oral solid diet introduction</i>	
9. Restrictive intravenous fluid therapy	Y/N	19. <i>Day of urinary catheter removal</i>	
10. Use of nasogastric tube	Y/N	20. <i>Day of mobilization</i>	

<sup>^</sup>Y/N – stands for YES/NO answer. Open questions written in *Italics*.

**Table II.** Acceptance of elements of perioperative care according to the questionnaire

Group 1. Highly accepted elements of perioperative care		Group 2. Weakly accepted elements of perioperative care	
Element	% of acceptance	Element	% of acceptance
Preoperative patient education	87	No bowel preparation, colon	30
Antithrombotic prophylaxis	96	No bowel preparation, rectum	20
Antibiotic prophylaxis	96	Preoperative oral carbohydrate loading	20
Restrictive intravenous fluid therapy	80	Use of laparoscopic techniques	16
No use of nasogastric tubes	84	No routine use of drains	13
Use of locoregional techniques for analgesia	78	Non-opioid analgesia	27
Postoperative oxygenation	79	Prophylaxis of postoperative nausea and vomiting	42
		Early oral fluid intake	11
		Early oral food intake	2
		Early urinary catheter removal	3
		Early mobilization	16

do not prepare the patient’s large bowel in case of rectal surgery. Only 20% of patients would receive preoperative oral carbohydrate loading. Sixteen percent of respondents from 5 surgical departments prefer the laparoscopic approach. Thirty percent of patients will have no drains left routinely in peritoneal cavity, and when drains are used the average length is 2.5 days (range: 0–6 days). Prophylaxis of postoperative nausea and vomiting (PONV) would be initiated in 42% of patients. Early oral fluids and diet would be introduced in 11% and 2% of patients subsequently. The urinary catheter would be removed during 24 h postoperatively in 3% of patients. Early mobilization would be encouraged in 16% of patients. Table III presents answers to open questions.

**Discussion**

In the analyzed material several elements of perioperative care have quite a high level of acceptance among general surgery consultants (e.g. patient education, antibiotic and antithrombotic prophylaxis, postoperative oxygenation). Nevertheless, a number of crucial elements of modern evidence-based clinical practice are not routinely followed (no bowel preparation, use of laparoscopy, no drains, early oral intake and early mobilization).

It was remarkable that when certain elements were dependent on the surgeon (laparoscopy, no drains, etc) they were very poorly accepted. On the other hand, surgeons were ready to accept elements managed by anesthesiologists (e.g. restrictive intravenous fluid therapy, multimodal analgesia). Inter-

**Table III.** Open question results

Parameter assessed in open question	< 24 h	1 <sup>st</sup> day	2 <sup>nd</sup> day	3 <sup>rd</sup> day	≥ 4 <sup>th</sup> day
Length of antibiotic prophylaxis	28%	21%	9%	22%	20%
Length of peritoneal drainage	10%	5%	32%	25%	28%
Introduction of oral fluids	11%	50%	26%	9%	4%
Introduction of oral diet	2%	10%	32%	36%	20%
Removal of urinary catheter	3%	33%	24%	26%	14%
Mobilization of patient	16%	65%	14%	4%	1%

estingly, an ERAS survey among anesthesiologists from 27 countries by Greco *et al.* showed low acceptance of most anesthesiological elements (avoidance of premedication and opioids, targeted intravenous fluid policy, preoperative fasting and early nasogastric tube removal) [12].

### Lack of mechanical bowel preparation

Compared to results from Malopolska Voivodeship, even a smaller percentage of Spanish (14%) and Swedish (3%) colorectal surgeons do not prepare the bowel for elective resections [13, 14]. According to an available Cochrane meta-analysis there is absolutely no benefit from bowel preparation in every available context (amount of anastomotic leakage, wound infections, reoperations, mortality, etc.), and it should be reserved for selected cases [15].

### Preoperative oral carbohydrate loading

An element that is not accepted by surgeons not only in southern Poland but also in western surgical centers is preoperative oral carbohydrate loading [16]. In Spain only 3% of surgeons use it. Traditional preoperative fasting results in increased insulin resistance, causes longer postoperative ileus and prolongs LOS [13]. The preoperative oral carbohydrate loading can decrease these negative outcomes prior to elective colorectal surgery in a safe manner [17, 18].

### Laparoscopy

There is plentiful evidence that laparoscopy short- and long-term outcomes are very good [19–21]. When combined with the ERAS protocol, laparoscopy shows the best treatment outcomes and therefore should be strongly promoted among surgeons around the globe [22]. Nevertheless, barriers to laparoscopy in colorectal surgery are still numerous [23]. Among the most common are lack of skills and adequate training. Moreover, some believe that laparoscopy is associated with higher costs and can be oncologically inferior to open surgery [21, 24]. This requires actions from health education managers directed at widespread application of laparoscopic techniques. Interestingly, a survey from the UK showed that laparoscopy enthusiasts are good at implementing other elements of the ERAS protocol [25].

### Drains

In uncomplicated elective colorectal surgery they do not offer lower morbidity and mortality, and do not influence the number of anastomotic leakages, and hence should be discouraged [26–28]. Still, as seen in an Austrian and Germany survey, too many surgeons still leave drains [29].

### Early catheter removal

Very low acceptance is also seen with early urinary catheter removal – only 3% of respondents would remove it within the first 24 h, despite the fact that it is safe and does not increase the risk of urinary retention [1, 2].

### Early mobilization

This is known to be one of the key elements of perioperative care allowing faster recovery [30]. A problem with early mobilization could result from low compliance with other elements, such as prolonged catheterization and routine drain use. Therefore change of perioperative care of the majority of respondents should be encouraged, since the acceptance rate of early mobilization was only 16%.

### Postoperative *nil per os* diet

This also has no scientific basis. Lewis *et al.* after a meta-analysis of 13 trials concluded that early enteral nutrition is associated with reduced mortality and may be of significant benefit [31]. In a British survey 88% and 80% of patients were allowed fluids and solid food intake on the first postoperative day, respectively [25].

### Limitations of the study

This study shows the view of the general surgery consultants rather than colorectal surgeons as in other similar studies. Data were collected from only one region of Poland. The response rate was average, but comparable to other questionnaire studies on the topic. Acceptance of certain elements of perioperative care does not mean they are routinely practiced by the respondent.

### Conclusions

Many elements of perioperative care in elective colorectal surgery in Malopolska Voivodeship are

still dictated by dogma and are not evidence-based. The level of acceptance of many important ERAS protocol elements is low. Surgeons are ready to accept only changes that do not interfere with their practice. A barrier resulting from unwillingness to change surgeon-dependent elements still exists. Workshops, seminars and constant internal and/or external audits may increase the acceptance of modern evidence-based perioperative care. Moreover, laparoscopic colorectal resections should become more available, even though ERAS protocol elements can also be used in open surgery.

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## Conflict of interest

The authors declare no conflict of interest.

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