

# Monitoring Needs and Goal-directed Fluid Therapy Within an Enhanced Recovery Program



Gary Minto, MB ChB, FRCA<sup>a,\*</sup>, Michael J. Scott, MB ChB, MRCP, FRCA, FFICM<sup>b</sup>,  
Timothy E. Miller, MB ChB, FRCA<sup>c</sup>

## KEYWORDS

• Fluid therapy • Colorectal surgery • Cardiac output monitoring • Enhanced recovery

## KEY POINTS

- Enhanced recovery principles mitigate against many of the factors that traditionally led to relative hypovolemia in the perioperative period.
- Individualization of fluid prescription requires consideration of clinical signs and hemodynamic variables.
- A large literature spanning 4 decades supports goal-directed fluid therapy.
- Application of this evidence to justify stroke volume optimization in the setting of major surgery within an enhanced recovery program is controversial.

Individuals having major abdominal surgery need perioperative fluid supplementation. This requirement is caused by:

- A physiologic stress response to the surgery. Incision and tissue handling trigger endocrine and inflammatory changes that lead to:
  - Redistribution of water from body fluid compartments
  - Endothelial changes promoting leakage of fluid out of capillaries
  - Redistribution of blood flow
  - Activation of sodium and water retention mechanisms
- The magnitude of the stress response varies between individuals, and even within the same individual, depending on the condition in which they present

---

Conflicts of interest: G. Minto declares he has no conflicts of interest.

<sup>a</sup> Department of Anaesthesia & Perioperative Medicine, Plymouth Hospitals NHS Trust, Plymouth University Peninsula School of Medicine, Plymouth PL6 8DH, UK; <sup>b</sup> Department of Anaesthesia and Intensive Care Medicine, Royal Surrey County Hospital, University of Surrey, Guildford GU1 7XX, UK; <sup>c</sup> Department of Anesthesiology, Duke University Medical Center, Durham, NC 27710, USA

\* Corresponding author.

E-mail address: [gary.minto@nhs.net](mailto:gary.minto@nhs.net)

Anesthesiology Clin 33 (2015) 35–49

<http://dx.doi.org/10.1016/j.anclin.2014.11.003>

[anesthesiology.theclinics.com](http://anesthesiology.theclinics.com)

1932-2275/15/\$ – see front matter © 2015 Elsevier Inc. All rights reserved.

for surgery. Patients who are acutely ill tend to have a greater inflammatory response; this may be modified by preoperative factors such as nutritional status, neoadjuvant chemotherapy and radiotherapy, antibiotics, and steroids.

- Replacement of losses:
  - Preoperative dehydration if oral fluids are withheld
  - These effects may be magnified by bowel preparation
  - Losses caused by the underlying disorder (eg, preoperative vomiting, diarrhea, or evaporative losses)
  - Blood loss, although major hemorrhage is rare during elective bowel surgery
- Hemodynamic changes induced by anesthesia:
  - Vasoparesis and venodilatation in response to neuraxial blockade<sup>1</sup>
  - Drug effects on vasomotor tone and cardiac contractility; in general, anesthesia promotes vasodilatation
  - Vasoconstriction in response to pressor agents
- Hemodynamic changes induced by surgical conditions:
  - Positioning (eg, head up or down, prone<sup>2</sup>)
  - Pneumoperitoneum to facilitate laparoscopic surgery
- Reduced oral intake in the postoperative period, which may be complicated by intestinal ileus, excessive use of opioids, gastric tubes, nausea, vomiting.

Many of these mechanisms promote hypovolemia, which is a deficit in intravascular fluid volume.

## PERIOPERATIVE FLUID REQUIREMENTS IN THE CONTEXT OF ENHANCED RECOVERY

In contrast with the emergency setting, in which many of the pathophysiologic perturbations discussed earlier are already in place at the time of surgery, enhanced recovery mitigates against most of these factors.

- Patients are brought to theater in a well-hydrated state, having also been provided with preoperative carbohydrate drinks.
- Routine bowel preparation is avoided for most colonic resections.
- Laparoscopic or small-incision surgery seeks to minimize physiologic disturbance.
- Long-acting opioids, which may cause ileus, are avoided.
- In many enhanced recovery (ER) programs, epidural blockade is also avoided, minimizing hemodynamic changes caused by regional anesthesia.<sup>3</sup>
- ERs incorporate a general fluid therapy philosophy of avoidance of sodium and water overload (discussed later).
- Early resumption of enteral feeding, early mobilization, and reduced tubes and drains are intended to allow patients to self-regulate their fluid and nutritional intake from soon after surgery.<sup>4</sup>

For these reasons perioperative fluid management may be different within ER pathways than in other settings.

## GENERAL APPROACHES TO INTRAOPERATIVE FLUID THERAPY

### *Fixed-volume Strategies*

During surgery, intravenous fluid administration is necessary. In the past, a simplistic fixed-volume approach has been used, whereby an estimated baseline fluid regimen is commenced, and then modified based on measurement of preoperative and ongoing losses, and on information from conventional hemodynamic monitoring.

Download English Version:

<https://daneshyari.com/en/article/2744309>

Download Persian Version:

<https://daneshyari.com/article/2744309>

[Daneshyari.com](https://daneshyari.com)