



Practical nutritional interventions in the perioperative period: an update

Key points:

- Perioperative nutritional and metabolic interventions are as important as other perioperative practices in improving surgical outcomes
 - These interventions focus on optimising the patients' response to the surgical insult, rather than correcting long-standing malnutrition
 - This update will highlight practical interventions that can be implemented by the clinician during the perioperative period; severely malnourished patients require additional support from the multidisciplinary team (MDT).
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Introduction

Good perioperative nutritional and metabolic management is central to the outcome of the surgical patient, and is as important as other routine considerations in the prevention of post-operative complications. This importance is reflected in the core anaesthetics curriculum (box 1).

This nutshell article highlights the practical evidence-based nutritional and metabolic interventions that should be considered for surgical patients.



Box 1 :

Core level training curriculum, The Royal College of Anaesthetists, Edition 2, 2010.

GU_BK_08 "Recalls/explains the relevance of metabolism and nutrition in the perioperative period"

POM_BK_18 "Describes the impact of nutritional status on patient outcomes"

POM_BK_30 "Describes the consequences of postoperative malnutrition"

PB_BK_85 " Principles of nutrition: carbohydrates, fats, proteins, vitamins and minerals. Energy requirements/expenditure and measurement."

Which patients require intervention?

All patients, whether nutritionally deplete or replete, will mount a metabolic response to surgery. This results in an increased secretion of catabolic hormones and the breakdown of glycogen, fat and protein, leading to loss of muscle tissue and increased glucose production [1]. Perioperative nutritional intervention is therefore required in every surgical patient to optimise the body's response to surgery. Nutritionally deplete patients, or those 'at risk of being unable to cover appropriately by oral intake their energy requirements for a longer period of time' [2] may require additional nutritional therapy.

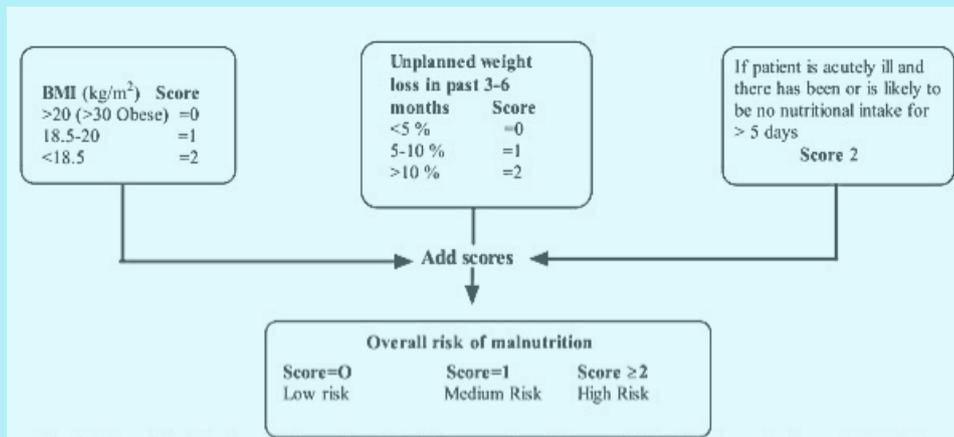
Practicalities

Screening: All surgical candidates require nutritional assessment on admission or first contact. Multiple assessment tools exist; the Malnutrition Universal Screening Tool (MUST, Box 2) and Nutritional Risk Screening (NRS, Box 3) are recommended by ESPEN to highlight medium or high-risk patients who will require an inter-professional approach with input from specialist members of the MDT.



Box 2:

The 'Malnutrition Universal Screening Tool'. Reproduced with the kind permission of BAPEN, see www.bapen.org.uk



Preoperative: Recent evidence has shown that the hours leading up to surgery provide an important window of opportunity, during which optimisation of nutritional and metabolic management can influence surgical outcomes. Pre-operative fasting from midnight, traditionally enforced because of the assumed risk of aspiration of stomach contents, is no longer recommended; instead, clear fluids may be taken up to two hours prior to surgery, a light meal up to six hours, and a fried or fatty meal up to eight hours beforehand [4]. Indeed, preoperative supplementation in the form of 800ml of carbohydrate drink the night before surgery, with a further 400ml 2-3 hours before surgery, is recommended for all surgical patients, as they confer reduced post-operative thirst and hunger, and preserved body mass with faster return of muscle function [5].



Box 3:

The Nutritional Risk Screening (NRS) -2002 score. Kondrup et al, Clin Nutr 2003

Score 0 = Normal nutritional status

Score 1 [Mild]: Wt loss >5% in 3 months or food intake below 50-75% normal requirement in preceeding week

Score 2 [Moderate]: Wt loss >5% in 2 months or BMI 18.5 – 20.5 + impaired general condition or food intake 25-50% normal requirement in preceeding week

Score 3 [Severe]:Wt loss >5% in 1 mo (>15% in 3 mo) or BMI <18.5 + impaired general condition or food intake 0-25% normal requirement in preceeding week

Intraoperative: The perception that all surgical patients are hypovolaemic due to a period of fasting and insensible losses is no longer supported. Indeed, evidence shows that a significantly positive fluid balance (causing >3kg weight gain) delays tolerance of oral intake post-operatively, thus impacting on resumption of normal nutrition. Current recommendations state crystalloid maintenance fluids should be administered at a rate of 20 to 30 ml/kg/h in low-risk patients undergoing short surgery, and at a rate of 1 to 2 ml/kg/h for patients undergoing procedures of longer duration or magnitude [6].

Postoperative: Hyperglycaemia is an independent risk factor for post-operative complications, even in patients without diabetes mellitus. However, despite early evidence favouring tight perioperative glycaemic control (BMs between 9-11), hypoglycaemic complications proved to be significantly higher with no overall benefit on mortality rate. In the absence of evidence-based target blood glucose ranges, clinicians are advised to maintain blood glucose concentrations <180mg/dL [7].

Early reinstatement of normal diet, rather than a clear liquid diet, has been shown to have multiple benefits including significantly shortened length of inpatient stay. The Enhanced Recovery After Surgery (ERAS) programme should be used to support clinicians in initiating oral nutrition immediately after surgery in patients without abdominal distension, nausea or emesis.



Summary

Practical nutritional and metabolic interventions in the perioperative period improve patients' surgical outcome. Severely malnourished patients require additional support.

References

- 1 J. P. Desborough, The stress response to trauma and surgery. *Br J Anaesth* (2000) 85: 109-117.
- 2 Weiman A, Braga M, Carli F et al. ESPEN guideline: Clinical nutrition in surgery. *Clinical Nutrition* (2017) 36: 632-650
- 3 Neelemaat F, Meijers J, Kruizenga H et al. Comparison of five malnutrition screening tools in one hospital inpatient sample. *J Clin Nurs*. (2011) 20:2144-56
- 4 Smith I, Kranke P, Murat I et al. Perioperative fasting in adults and children: guidelines from the European Society of Anaesthesiology. *Eur J Anaesthesiol* 2011;28:556-569
- 5 Miller K, Wischmeyer M, Taylor B et al. An evidence-based approach to perioperative nutrition support in the elective surgery patient. *Journal of Parenteral and Enteral Nutrition* (2013) 37:39S-50S
- 6 Navarro L, Bloomstone J, Auler J et al. Perioperative fluid therapy: a statement from the international Fluid Optimization Group. *Perioperative Medicine* (2015) 4:3
- 7 The NICE-SUGAR Study Investigators. Intensive versus Conventional Glucose Control in Critically Ill Patients. <http://www.nejm.org/doi/full/10.1056/NEJMoa0810625-footNotesItemFN1N> *Engl J Med* 2009; 360:1283-1297

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