

To the Editor, Patient blood management : the way to effective and safe implementation

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During the Annual Wintersymposium of the department of Anesthesiology of the UZ Leuven (February 2019), Prof. Xavier Capdevilla (Professor and Chair of Anesthesiology at the Lapeyronie Hospital, University of Montpellier) gave a well-attended and extremely interesting talk on the importance for patient outcome of effective patient blood management (PBM). He also explained in detail how to implement an effective PBM program.

The estimated number of surgical interventions performed worldwide each year is >320 million, of which 20 million are Caesarean sections. Despite the fact that surgery and anesthesia have become extremely safe, mortality and morbidity remain a problem.

Preoperative anemia is an important issue in many surgical patients, with older studies suggesting that in >30% of surgical patients, anemia is present pre-operatively. Anemia is defined as a hemoglobin concentration <13 g/dL in men and <12 g/dL in women. Anemia is associated with an increased mortality and morbidity. Mortality increases by a factor of 2.9. Similar odds are described for renal failure (3.75), infection (1.9), need for blood transfusions (2.9), while hospital stay is prolonged by 22%. We've also known for many years that, if patients receive peri-operative transfusions, their mortality risk increases as well, especially in the elderly. Even a single unit of red blood cells increases the risk of ischemic stroke and myocardial infarction.

Hospitals are striving towards more high-quality care and are being evaluated by external organizations. Currently, a lot of patients with preoperative anemia remain undetected and are not treated accordingly. Particularly in Belgium, this issue is important because the surgical preoperative screening is often performed only shortly before surgery.

What is PBM ? PBM has three pillars:

a) Pre-operative correction and optimization of the red blood cell mass (RBC mass).

b) Minimization of blood loss during surgery and postoperatively.

c) Improvement of the physiological coping mechanisms when anemia occurs.

Effective PBM systems need to be implemented to reduce the need for transfusions and to improve outcome of surgical care.

When implementing PBM in a hospital, several steps are necessary:

1. Create a sense of Urgency.
2. Form a PBM group.
3. Create a PBM vision.
4. Communicate the vision.
5. Empower the PBM group and remove obstacles.
6. Create short term wins.
7. Build on the change and the positive effects.
8. Anchor PBM in culture.

As anesthesiologists, we are extremely well educated and experienced in pillars 2 and 3. However, pillar 1 (pre-operative optimization of RBC mass) is still in its infancy in many institutions worldwide, and certainly in Belgium. Munoz et al. in an international consensus statement published in *Anaesthesia* in 2017 indicated that, if the risk of transfusion and blood loss increases, elective surgery should be postponed until anemia is corrected (1) Effective preoperative optimization of RBC mass starts with good detection of anemia (and its causes). In order to evaluate anemia, hemoglobin levels need to be determined in all patients undergoing surgery with a high risk of hemorrhage. Additionally, it is required to evaluate the iron status of the patients. In patients that are iron deficient, pre-operative administration of IV iron can be of tremendous value as it increases the hemoglobin level, reduces the need for transfusion, and thus reduces morbidity

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and mortality. However, to be effective, IV iron needs to be administered well in advance of surgery (probably 1-2 weeks before the procedure). So, an effective pillar 1 is only possible when patients are referred early to anaesthesiology screening and a system is in place to administer IV iron.

To improve patient care in surgical patients, to reduce morbidity and mortality and to reduce healthcare costs, it is clear that preoperative optimization of RBC mass is essential. This requires

leadership and changes in numerous processes when preparing a patient for surgery. A major healthcare benefit is possible !

References

1. Munoz M, Acheson AG, Auerbach M, Besser M, Habler O, Kehlet H, *et al.* 2017. International consensus statement on the peri-operative management of anaemia and iron deficiency. *Anaesthesia*; **72**: 233-47