



Applied physiology in perioperative medicine: a concept for the future

Surgery has become safer and safer over the last decades on the one hand as a result of highly sophisticated non-invasive approaches that aim to replace operations with excessive tissue trauma and on the other hand due to the developments in anesthesiology and intensive therapy. The latter has been mentioned more and more frequently in the context of perioperative medicine often referred to as an entity on its own. This means that pre-, intra-, and postoperative care should not be considered as independent components managed by different teams but rather dealt with as one process and managed by using a holistic approach.

Increased safety measures and standards in perioperative care resulted in improved outcomes in general, but this increased confidence brought along a new problem, the high-risk surgical population, which accounts for 80% of postoperative mortality (1). According to the results of the recent European Surgical Outcomes Study (EUSOS), the mortality in patients undergoing non-cardiac surgery is higher than anticipated (2).

In order to reduce postoperative complications and hospital stay in the overall surgical population and improve survival in the high-risk surgical patients we have to understand as much of physiology and pathophysiology as possible, and we have to translate this knowledge into our everyday clinical practice. Fortunately, thanks to the high quality and extensive research activity of the critical care community we have learned a lot in recent years about circulation and hemodynamics (3), the lungs and mechanical ventilation (4), the patients' immune response, antibiotic stewardship (5) and nutrition (6), just to name a few.

In the current Focus Issue of the *Journal of Emergency and Critical Care Medicine* our aim was to invite some of the leading researchers in the field of applied physiology in perioperative medicine. We are covering issues starting from defining the high-risk patient, down to the deep secrets of the mitochondria. Applying a physiology- and also the evidence-based approach at the bedside is not the exclusive privilege of researchers but should be the duty of every physician in the future.

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None.

Footnote

Conflicts of Interest: Z Molnar, received regular honoraria for being in the Medical Advisory Board of Pulsion Maquet (Feldkirchen, Germany), for lectures from Biotest AG (Dreieich, Germany), ThermoFisher Scientific (BRAHMS, Hennigsdorf, Germany) and he is a Medical Director of CytoSorbents Europe (Berlin, Germany). J Benes, collaborates with Edwards Lifesciences Inc. (Irvine Ca USA), CNSystems Medizintechnik GmbH (Graz, Austria) and Pulsion Maquet (Feldkirchen, Germany). BS, collaborates with Pulsion Medical Systems SE (Feldkirchen, Germany) as a member of the medical advisory board and has received institutional restricted research grants, honoraria for giving lectures, and refunds of travel expenses from Pulsion Medical Systems SE. B Saugel has received research support and honoraria for giving lectures from Edwards Lifesciences (Irvine, CA, USA). B Saugel has received institutional restricted research grants, honoraria for giving lectures, and refunds of travel expenses from CNSystems Medizintechnik GmbH (Graz, Austria). B Saugel has received institutional restricted research grants, honoraria for consulting, and refunds of travel expenses from Tensys Medical Inc. (San Diego, CA, USA). BS has received institutional restricted research grants from Retia Medical LLC. (Valhalla, NY, USA). B Saugel has received honoraria for giving lectures from Philips Medizin Systeme Böblingen GmbH (Böblingen, Germany).

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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