
Department of Anesthesiology, Resuscitation and Intensive Medicine

Research at the Clinic of Anaesthesiology, Resuscitation and Intensive Care Medicine (KARIM) belongs to the three pillars of medicine alongside clinical practice and teaching. Some topics have been consistently maintained and expanded for more than 10 years. In addition to basic research in animal models, short- and long-term (more than one year) clinical trials and, more recently, academic clinical trials are conducted at KARIM. There are 3 main research teams at KARIM, which annually publish a number of papers in both foreign impacted and domestic peer-reviewed journals. Our physicians also regularly present their results at national and international congresses and develop international collaborations including short research fellowships (Mayo Clinic, MN, USA; Dalhousie University, NS, Canada). Czech and foreign students of the Faculty of Medicine in Hradec Králové and the Faculty of Pharmacy in Hradec Králové are also recruited to research projects at KARIM.

The department is a nationally recognised centre for teaching artificial pulmonary ventilation. Every year it organizes the Academy of Artificial Pulmonary Ventilation under the leadership of Assoc. MUDr. Pavel Dostál, Ph.D., MBA. Anatoly Truhlar, M.D., Ph.D., FERC is co-author of the European Recommended Practice for Resuscitation (ERC guidelines, 2015, 2021). The Department provides the operation of the Centre for Resuscitation and Emergency Management at the University Hospital Hradec Králové under the leadership of doc. MUDr. Vlasta Dostálová, Ph.D., MBA, where simulation teaching is used.

Main research topics

- **Research on microcirculation and endothelial glycocalyx** (development of diagnostic methods, testing of interventions used in the clinic on the state of glycocalyx and capillary membrane function) doc. MUDr. David Astapenko, Ph.D., MBA.
- **Clinical phenotype of SARS-CoV-2 vaccinated persons hospitalized for COVID-19 disease as a basis for optimization of national vaccination strategy and post-exposure prophylaxis** (one of the thematic clinical studies on COVID-19 supported by AZV grant) prim. MUDr. Renata Černá Pařízková, Ph.D., LL.M.
- **Influence of anaesthetic procedures on cerebral microcirculation and brain function in patients undergoing neurosurgical procedures**. doc. MUDr. Vlasta Dostálová, Ph.D., MBA.
- **Influence of anesthesiological techniques on regional oxygenation and tissue perfusion**. MUDr. Zdeněk Turek, Ph.D.

Scientific research groups

At KARIM there are 3 research groups with their own research topics working under the leadership of Assoc. MUDr. David Astapenko, Ph.D., MBA; doc. MUDr. Vlasta Dostálová, Ph.D., MBA and MUDr. Zdeněk Turek, Ph.D. Non-medical medical staff (nurses, laboratory assistants, perfusionists) and students of the Faculty of Medicine and Pharmacy also participate in the research teams. Members of the medical team of the Institute also cooperate in other selected scientific research and often interdisciplinary topics with extramural domestic and foreign academic partners.

- Glycocalyx (see above)
- COVID-19 (see above)
- Microcirculation neurosurgical anesthesia (see above)

Equipment

- **Microvision Medical camera** (non-invasive stroboscopic reflectance microscopic camera for research of microcirculation of mucosal and organ surfaces).
- **KK camera** (non-invasive stroboscopic reflectance microscopic camera for research on microcirculation of mucosal and organ surfaces).
- **Automated vascular analysis software 4.3C** (automated software for recording and evaluating microcirculation recordings).
- **GlycoCheck software** (automated software for recording and evaluating microcirculation recordings).
- **Laser Doppler flowmetry and regional oximetry**.

Achievements

The department has received several awards of the Czech Society of Anaesthesiology, Resuscitation and Intensive Care Medicine for the best original work in a foreign journal with impact factor and in a domestic peer-reviewed journal. Research projects have been and are supported by two grants from the Czech Health Research Agency. In 2020, a review article Clinical relevance of endothelial glycocalyx in critically ill patients was published by David Astapenko, MD, PhD, MBA et al. in the prestigious Annual Update in Intensive Care and Emergency Medicine.