The Future
ICU

The Future of Haemodynamic Monitoring: From Planet Mars to Resource-Limited Countries, *F. Michard, M. Fortunato, A. Pratas, S. Rodrigues de Oliveira*

Clinical Decision Support Systems: Future or Present in ICU? *A. Naharro-Abellán, B. Lobo-Valbuena, F. Gordo*

The Future of Critical Care Ultrasound, *A. Butnar, A. Wong, S. Ho, M. Malbrain*

Future ICU Design: Return to High Visibility, *D. Hamilton, S. Swoboda, C. Cadenhead*

A Framework for Addressing Seasonal Influenza: A Critical Care Perspective, *L. Busse, C. Coopersmith*

Will Artificial Intelligence Change ICU Practice? *V. Herasevich, M. Keegan, M. Johnston, B. Pickering*

Future Strategies in Sedation and Analgesia, *B. Pastene, M. Leone*

Critical Care Telemedicine: A Management Fad or the Future of ICU Practice? *K. Iliopoulou, A. Xyrichis*

The Intersection of Big Data, Artificial Intelligence, Precision and Predictive Medicine to Create the Future of Critical Care, *G. Martin*

The Intelligent Intensive Care Unit: Integrating Care, Research and Education, *E. Cox, I. van der Horst.*

PLUS

Introducing the Intubation Credit Card, *A. Higgs, S. Goodhand, A. Joyce*

Improving Recognition of Neonatal Sepsis, *M. Harris, A. Masino, R. Grundmeier*

Lifesaving Applications of Transoesophageal Echocardiography in Critical and Emergency Care, *R. Arntfield*

Shaping the Human Side of Medical Devices in Critical Care: The Implication of Human Factor Studies in Clinical Settings, *M. Micocci, A. Tase, M. Ni, P. Buckle, F. Rubulotta*

Diagnosis, Treatment and Management of the Critically Ill Patient, *R. Moreno*

Diagnosis, Treatment and Management of the Critically Ill Patient

Interview with Professor Rui P. Moreno, Neurocritical and Trauma Intensive Care Unit, São José Hospital, Centro Hospitalar Universitário de Lisboa Central E.P.E, Lisbon, Portugal.

Professor Rui P. Moreno works at the Intensive Care Unit of the Hospital de São José (Centro Hospitalar Universitário de Lisboa Central E.P.E) as the coordinator of the Neurocritical and Trauma ICU. Prof. Moreno has been a member of the European Society of Intensive Care Medicine (ESICM) since 1995 and became President of the Society in 2008. He was also co-chair of the Surviving Sepsis Campaign from 2009-2011. Prof. Moreno has been interested in severity of illness scores. His description of the SOFA score is one of the most cited papers in this particular area. He also played a critical rule in creating, describing and validating the SAPS 3 scoring system. Prof. Moreno has been elected Council Representative to the World Federation, Chair of the European Board of Intensive Care, and has also chaired the Portuguese College and Board of Intensive Care. He has also published many papers in highly reputable journals and has made immense contributions to the field of intensive care medicine.

You have had a long-time interest in severity of illness scores. How important are these scores, in your opinion, and what role can they play in the management of critically ill patients?

As written by Hippocrates in Epidemics, Book 1, section 11 "The physician must be able to tell the antecedents, know the present, and foretell the future - must mediate these things, and have two special objects in view with regard to disease, namely, to do good or to do no harm. The art consists of three things- the disease, the patient, and the physician. The physician is the servant of the art, and the patient must combat the disease along with the physician."

Consequently, the development and application of severity scores are an obligation for the doctors, allowing them to foretell the future, to inform the patient or the family, and to apply the most effective approach at a certain moment in time to a patient consumed by disease and presenting with a given degree of severity.

Since there are so many types of scoring systems that are used in the ICU, which ones do you think are the most important? Also, do these scores complement each other, or are they mutually exclusive?

General severity scores that allow the user to describe the severity of groups of critically ill patients; General Prognostic Models that, based on the severity of illness and eventually in other variables, allow the computation of the probability of death; and Sequential organ failure scores that allow the user to describe sequentially the path of the organ dysfunctions/failures presented by the critically ill patient during the ICU stay.

SAPS 3 and APACHE II. How accurate are these scores? Is one better than the other? If yes, why?

Any general prognostic model (such as APACHE II or SAPS 3) is good when it reflects adequately the analysed population. SOFA should be used just to describe sequentially the path of the critically ill patient and not to make prognostications about the future.

Patient safety is an important element in healthcare, but medical errors are also a reality. In your opinion, which errors are most common in the ICU? How can the risk of errors be reduced?

Possibly the most common errors in the ICU are omission errors: late or missing diagnosis, late or missing therapies. The risk of errors can be reduced by creating redundant systems, and changing the safety

culture of the ICU.

Sepsis continues to be a lethal and complex disease. What are the contributing factors here? How do you think the burden of sepsis can be tackled?

The exponential increase in predisposition: older and more fragile patients, debilitated by chronic diseases and with a reduced margin to fight the acute insult. It must be addressed from a public health perspective: prevention, early and adequate diagnosis and early treatment, adequate rehabilitation after the acute stage. Always personalised (and not completely protocolised) and patient- and family-centred.

Recent findings suggest that sepsis is not one condition but that there are many sub-types of sepsis. Do you agree with this? And do you think the management of patients can be improved if treatment is based on subtypes?

Yes, certainly. Both prevention, diagnosis, and treatment should be based on sub-types, from which the most important are susceptibility and severity of illness.

Most of the time, quality of care is measured in terms of patient outcomes. But do you think there is a need to focus on the process of care itself? Do you think that should also be an important factor when measuring quality in the ICU?

Quality of care is a multimodal measure that encompasses effectiveness of care and safety of care. When measuring quality of care in the ICU, both dimensions are equally important. Outcome - seen exclusively as vital status at hospital discharge - in itself is important, but insufficient to evaluate the quality of care, since other factors, namely safety and effectiveness are crucial.

You are the co-author of the book Controversies in Intensive Care Medicine. Can you tell us something about it? What specific controversies are you referring to?

Our specialty is made of controversies. In our book we tried to visit the most important: those related to the creation and organisation of our specialty – Intensive Care Medicine - those related to the multiple options (antagonic or complementary) needed to provide safe and effective care to our patients, those related to the ethical issues of our practice and to the limits of our intervention. Since from debate comes the light, we focused on having these and other major issues discussed by the best experts on the topic. ∎