

## BOOK REVIEW

**Title: The Basic Principles of Critical Care Nephrology**

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In 2017, Nova Science Publishers are publishing a much needed text, the first of its kind by Czech authors, providing authoritative coverage of nephrology in critical care. Although the issues discussed are topical, many aspects remain unsolved. Hospital-acquired acute kidney injury (AKI) affects 5-7% of hospitalized patients and the prevalence is increasing along with that of sepsis. Sepsis and septic shock are the most common causes of AKI which develops in 19% of patients with sepsis, 23% of those with severe sepsis and around 50% in cases of septic shock.

The book reflects the many years of systematic research in critical care nephrology by N. Petejová and A. Martinek at the Department of Internal Medicine, Faculty of Medicine, University of Ostrava. There are ten sections covered in three chapters.

The first chapter deals with the etiology, epidemiology, pathophysiology, diagnosis and classification of AKI. The epidemiology section covers the causes of acute kidney injury in developing and developed countries with attention drawn to the lack of available resources such as dialysis in some regions of the world and in conditions of natural disasters among others. The first multinational study of the epidemiology of AKI in the critically ill is an important addition. The basic characteristics of novel AKI biomarkers are described in this chapter along with an explanation of acid-base, water and mineral metabolism disorders and treatment strategies.

The second chapter written as four large sections provides the reader with comprehensive information on the cardiorenal and hepatorenal syndromes and sepsis, opioid, benzodiazepine, paracetamol, ethylene glycol, methanol, organophosphate and *Amanita phalloides* intoxication. The sections are well-structured and referenced, citing key recent papers. The sepsis section includes a number of interesting and possibly surprising facts. According to the latest third consensus definition (Sepsis-3), sepsis is a life-threatening organ dysfunction caused by dysregulated host response to infection. To evaluate the presence of organ dysfunction, the Sequential Organ Failure Assessment (SOFA) or its shortened version Quick Sequential Organ Failure Assessment (qSOFA) are recommended.

In developed countries, the number of patients hospitalized for sepsis has doubled over the last eight years, exceeding hospital stay rates for acute coronary syndrome.

It contributes to 30-50% of all hospital deaths and is thus, the single most common cause of death from infectious diseases. Adequate and timely antimicrobial therapy is crucial. In many respects, patients with AKI and sepsis are substantially different from those with other pathologies. Given the changes in distribution volume, reduced protein binding, the impaired function of organs involved in drug elimination and level of residual kidney function, the key to optimal antimicrobial therapy dosage is thorough knowledge of the pharmacokinetics and pharmacodynamics of selected antibiotics; in some cases, therapeutic drug monitoring has also proved useful.

The third chapter presents the basic characteristics and principles of intermittent and continuous renal replacement therapy (RRT), including the technical aspects, vascular access and anticoagulation strategies. Also detailed are other blood purification methods such as plasmapheresis, hemoperfusion, immunoabsorption as well as the option of extracorporeal liver support in acute liver failure (the MARS and FPSA systems).

Kidney function replacement in critically ill patients with AKI is a complex issue, one of the key clinical decisions being proper timing. The two largest studies on RRT published in 2016 however, produced completely contradictory results. In the AKIKI study, early RRT had no effect on patient mortality and in nearly half of the patients whose RRT was delayed, kidney function improved spontaneously. By contrast, the ELAIN study showed significantly lower 90-day mortality in patients on early RRT. Early RRT also led to shorter mechanical ventilation time, shorter hospital stays and more rapid improvement of kidney function.

The text is easy to read and understand by people of all nationalities. Each section delivers a clear educational message. This is contributed to by excellent book design, quality of print and clear tables and figures. Although primarily intended for intensivists, internists, nephrologists, diabetologists and urologists, physicians in other specialties may find it useful as well. Its teaching value will be appreciated by those preparing for specialist exams. I am confident that the book will receive the attention it deserves and contribute to improving care for critically ill patients.

*Josef Zdražil*