Preface

Renal Research Institute (RRI) 19th International Conference on Dialysis, Advances in chronic kidney disease (CKD) in Las Vegas, NV, showcases the recent developments in technology, basic science related to acute and CKDs, hemodialysis and peritoneal dialysis (PD) management, and epidemiology. The scope of the topics ranges from acute kidney injury (AKI) to hepatitis C therapy, from limb preservation programs to electrolyte disturbances, and from vascular disease to lipid lowering therapy.

The first paper in this special issue of *Blood Purification* by De Rosa et al. outlines the fact that patients with pre-existing renal dysfunction or CKD are prone to develop acute critical illness, requiring admission in the intensive care unit (ICU). The review details the pathophysiological mechanisms underlying the development of what the authors refer to as acute-on-chronic (AoC) kidney dysfunction and its role in the progression toward end-stage kidney disease.

Fluid homeostasis in humans is tightly regulated under physiological conditions as described by Ding et al. in their paper. Synthesizing classical principles and current evidence-based fluid homeostasis and the revised Starling principle, the authors conclude that solid evidence indicates the existence of endothelial surface layer and its

functional significance in microcirculatory fluid homeostasis and vascular protection, including as a barrier of plasma fluids extravasation, sheer stress, and receptor-mediated regulations, anti-thrombosis and anti-inflammation.

There is increasing interest in electing PD in the management of critically ill patients with AKI in the ICU. Ponce et al. show in their review that PD is a simple, safe, and efficient way to correct metabolic, electrolyte, acid-base, and volume disturbances due to AKI, and that PD can be used as modality in the ICU setting. The authors indicate that earlier concerns regarding inefficiency of PD compared with other modalities have been mostly dissipated. Recent reports have shown that in units regularly performing PD for AKI, mortality and complication rates have fallen. Although other modalities may not offer any outcome benefit over PD, it remains to be shown whether the more rapid recovery of renal function seen with acute PD has a long-term overall benefit compared to other modalities.

Electrolyte and acid-base derangements in CKD and end-stage renal disease (ESRD) are common and are associated with increased morbidity and mortality. Dhondup and Qian discuss current understanding of electrolyte and acid-base disorders in CKD and ESRD and de-

scribe novel therapeutic approaches, such as newer K-lowering agents.

The review on the causal link between CKD vascular stiffness and hyperuricemia by Ramirez-Sandoval et al. summarizes relevant literature on the role of serum uric acid associated with vascular disease, in particular arterial stiffness.

Kaysen provides, in his contribution, a closer look on lipid lowering therapy in CKD. Treatment with statins reduces the risk of death and cardiovascular outcomes among patients not yet requiring renal replacement therapy, but is not effective once dialysis is initiated, most likely because other processes, such as inflammation, not affected by lipid lowering therapy, dominate in the causal pathway leading to adverse outcomes.

Jie Ma et al. have investigated the association of red blood cell life span (RBCLS) and markers of inflammation in chronic hemodialysis patients. Being one of the first studies in that field, the key finding is the, somewhat surprising, lack of correlation between RBCLS and inflammatory markers, indicating a limited role of inflammation in the genesis of premature RBC death.

Jadoul and Martin highlight, in their review, the remarkable progress made in the treatment of hepatitis C virus (HCV) in CKD patients of stages 4 and 5. Advancement in antiviral therapies has now brought the cure for HCV within reach. This progress should help in lowering the prevalence of HCV in the dialysis population and, thus, reduce the risk of nosocomial transmission of HCV in hemodialysis units. Eradication of HCV from hemodialysis clinics is now a realistic goal.

Flores et al. studied the association between plasma gelsolin (pGSN), a protein that binds actin in the circulation, and hospitalization and mortality in hemodialysis patients. In their study, pGSN was directly associated with body mass index, serum albumin and creatinine, and inversely with age, C-reactive protein, and interleukin-6. Patients who died during follow-up tended to have lower levels of pGSN, but after adjusting for confounding variables, pGSN was not associated with all-cause or cardiovascular mortality and hospitalization.

Limb amputation remains a significant challenge for patients and health professionals, and a substantial financial burden to the healthcare system. Neville and Kayssi propose a limb preservation program with a multidisciplinary

approach that would standardize care for the patients with critical limb ischemia and limb threatening ischemia, mitigating some of the factors that cause disparity in patient care. Additionally, such a program fosters education and research regarding wound healing and advanced revascularization techniques that continue to evolve with a focus on prevention.

Chan et al. have analyzed the National Inpatient Sample for trends and outcomes of hospitalizations with focus on ESRD patients with depression. The authors report that the proportion of ESRD hospitalizations with depression doubled from 2005 to 2013 and significant differences in demographics and comorbidities were observed for hospitalized hemodialysis patients with depression.

Using modern wearable tracking technology, Williams et al. investigated physical activities and sleep patterns in hemodialysis patients in a suburban environment. The authors obtained valuable information that may assist hemodialysis patients to become more active and may open avenues for novel interventions.

The RRI is dedicated to advancing therapy options for dialysis patients and to provide the highest caliber of care based on research and advanced clinical technology. RRI is committed to research and innovation that will lead to improved patient outcomes and quality of life. It has active national and international research programs with strong academic alliances with the University of Michigan, Ann Arbor, MI; University of North Carolina, Chapel Hill, NC; University of Rochester, Rochester, NY; Mount Sinai School of Medicine, New York, NY; St. Raphael Hospital/Yale, New Haven, CT; University of Massachusetts, Lowell, MA; Pontifical Catholic University of Paraná, Curitiba, Brazil; the University of Maastricht, The Netherlands; the Taipei Medical University Hospital, Taiwan; and the University of Konstanz, Germany, among others.

We hope that you will enjoy the wide range of papers published in this issue of *Blood Purification* and that you will consider attending next year's 20th International Conference on Dialysis, Advances in Kidney Disease 2018.

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