

Critical Care Nephrology: A Multidisciplinary Approach

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Key Words

Critical care nephrology · Acute kidney injury · Acute kidney disease · Precision medicine

Abstract

Acute kidney injury (AKI) is a serious medical condition affecting millions of people. Patients in intensive care unit (ICU) who develop AKI have increased morbidity and mortality, prolonged length of stay in ICU and hospital and increased costs, especially when they require renal replacement therapy. In the latter case, morbidity and mortality increase further. In order to meet the needs of the critically ill patients, a multidisciplinary care team is required, combining the efforts of physicians and nurses from different disciplines as well as nephrologists and intensivists. A personalized patient management is strongly recommended as proposed by the recent criteria of precision medicine. Early identification of patients at risk and timely intervention in case of AKI diagnosis can be obtained by integrating the role of nephrologist in the ICU practice. An innovative model of organization by introducing the nephrology rapid response team is advocated to manage critically ill patients with kidney problems in order to make early diagnosis and interventions, to reduce progression toward CKD and improve renal recovery. The routine adoption of AKI biomarkers together with such a collegial teamwork may represent the pathway toward success.

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Introduction

Acute kidney injury (AKI) is a serious medical condition affecting more than 10 million people around the world [1]. The incidence in the intensive care unit (ICU) population is between 20 and 30% depending on the used definition, and more than 10% of all patients admitted to the ICU require renal replacement therapy (RRT) for AKI [2]. The spectrum of AKI has recently expanded to the phase of recovery that may require a follow up for a period as long as 3 months. In this time window, the syndrome is called acute kidney disease (AKD) [3, 4].

The Rise of Critical Care Nephrology

The diagnosis and management of AKD is complex and requires a multidisciplinary effort, which is the basis for the new specialty called critical care nephrology (CCN). Not only nephrologists but also critical care physicians, cardiologists and cardiac surgeons should be involved collegially in this endeavor [5].

In fact, a multidisciplinary care team can address the multiple needs of a critically ill patients based on the pathophysiological foundations of the syndrome. In this setting, it is essential to identify the population and the single individual at risk of developing AKI [6, 7]. As for mechanical ventilation, the teamwork in CCN could rep-

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Critical Care Nephrology C. Ronco, R. Bellomo, 2012-12-06 Internists surgeons critical care physicians and nephrologists all treat critically ill patients with renal failure and the multiple system organ dysfunction syndrome A comprehensive review of the state of the art of this topic is definitely needed both in academic and clinical medicine and Critical Care Nephrology fulfils this need It is a useful reference tool for both nephrologists and intensive care specialists and it is therefore no coincidence that the editors of the book are themselves specialists in these particular fields The book addresses the following definitions of critical illness epidemiology monitoring and diagnostic procedures pathophysiology of organ systems in relation to kidney function concepts of renal physiologic and pathologic responses to various derangements oxygen transport and cardiovascular adaptations hemodynamic parameters respiratory parameters mechanical ventilation and cardiac support and severity score parameters The book is also devoted to all forms of acute renal failure with specific reference to intensive care patients The nature of the multiple organ dysfunction syndrome is discussed with special emphasis on the impact of different organs dysfunction and kidney failure Kidney function and acute renal failure in patients with kidney liver and heart transplants is also considered as well as acute illness occurring in chronic hemodialysis patients Special emphasis is placed on therapeutic interventions and treatment procedures Different forms of organ support are discussed including liver lung and cardiac therapy

Acute Kidney Injury Claudio Ronco, Rinaldo Bellomo, John A. Kellum, 2007-01-01 Acute kidney injury is defined as an abrupt change in serum creatinine and or urine output and a majority of patients admitted to the ICU have some evidence of the disorder Unfortunately treatment for this complex syndrome is as yet lacking and understanding is limited An interdisciplinary panel of experts has contributed to this volume illuminating some of the fundamental and complex aspects of the disorder ranging from pathophysiology to treatment from emerging biomarkers to genetic polymorphisms Other contributions focus on immunological issues or the many complications of acute kidney injury and co morbid conditions encountered covering the fundamentals as well as the latest developments Moreover important technical aspects of extracorporeal therapies including vascular access anticoagulation or fluid composition are introduced and different approaches to renal support from intermittent dialysis to continuous therapies and hybrid techniques are discussed A description of advanced extracorporeal techniques of organ support and their role in the management of sepsis and acute kidney injury in the context of an overall strategy of multi organ failure management concludes the discussions This volume not only provides a practical and up to date summary of current knowledge and technology but also imparts a fundamental understanding of the pathogenesis and likely future developments in this field It also serves to challenge and re examine the fundamental underlying assumptions we hold regarding critical illness in general and acute kidney injury in particular

Critical Care Nephrology Claudio Ronco, Rinaldo Bellomo, John A. Kellum, 2009-01-01 This 2nd edition of Critical care nephrology continues to provide comprehensive coverage of the latest

advances in critical care procedures for the adult or pediatric patient with renal diseases or disorders It presents a common language and standardized guidelines to help multi disciplinary physicians caring for the critically ill communicate more effectively BOOK JACKET **Critical Care Nephrology E-Book** Claudio Ronco,Rinaldo Bellomo,John Kellum,Zaccaria Ricci,2017-12-14 Comprehensive and clinically relevant the 3rd Edition of Critical Care Nephrology provides authoritative coverage of the latest advances in critical care procedures for patients with renal diseases or disorders Using common guidelines and standardized approaches to critically ill patients this multidisciplinary reference facilitates better communication among all physicians who care for critically ill patients suffering from kidney disease electrolyte and metabolic imbalances poisoning severe sepsis major organ dysfunction and other pathological events Offers detailed discussions of different forms of organ support artificial organs infections acute illness occurring in chronic hemodialysis patients and much more Places a special emphasis on therapeutic interventions and treatment procedures for a hands on clinical reference tool Presents information clearly in a format designed for easy reference from basic sciences to clinical syndromes to diagnostic tools Covers special populations such as children diabetic patients and the elderly An exceptional resource for nephrologists intensivists surgeons or critical care physicians anyone who treats critically ill renal patients Shares a combined commitment to excellence lead by Drs Claudio Ronco Rinaldo Bellomo John Kellum and Zaccaria Ricci unparalleled leaders in this field Addresses key topics with expanded coverage of acute kidney injury stress biomarkers and sepsis including the latest developments on mechanisms and management Provides up to date information on extracorporeal therapies from new editor Dr Zaccaria Ricci Expert Consult™ eBook version included with purchase This enhanced eBook experience allows you to search all of the text figures and references from the book on a variety of devices *Miller's Anesthesia* Lars I. Eriksson,2009-01-01 From fundamental principles to advanced subspecialty procedures this text is the go to reference on the technical scientific and clinical challenges professionals face Features new chapters new authors meticulous updates an increased international presence and a new full color design *Civetta, Taylor, & Kirby's Critical Care Medicine* A. Joseph Layon,Andrea Gabrielli,Mihae Yu,Kenneth E. Wood,2017-09-19 Covering every problem encountered in today s intensive care unit this leading critical care textbook presents the knowledge and expertise of more than 350 global experts in this fast changing field Beginning with the social aspects of medicine it then discusses monitoring and organ system pathobiology followed by specific diseases states syndromes Each chapter begins with immediate concerns and proceeds to broader based discussions of relevant pathophysiologic and clinical issues *Civetta, Taylor, & Kirby's Critical Care* Andrea Gabrielli,A. Joseph Layon,Mihae Yu,Joseph M. Civetta,Robert Wesley Taylor,Robert R. Kirby,2009 Now in its fourth edition this leading critical care textbook contains more than 30 new chapters and completely updated information The book addresses every problem encountered in the intensive care unit and covers surgical critical care more thoroughly than any other text **The ESC Textbook of Intensive and Acute Cardiovascular Care** Marco Tubaro,Pascal

Vranckx, Susanna Price, Christiaan Vrints, Eric Bonnefoy, 2021-03-08 The ESC Textbook of Intensive and Acute Cardiovascular Care is the official textbook of the Acute Cardiovascular Care Association ACVC of the ESC Cardiovascular diseases CVDs are a major cause of premature death worldwide and a cause of loss of disability adjusted life years For most types of CVD early diagnosis and intervention are independent drivers of patient outcome Clinicians must be properly trained and centres appropriately equipped in order to deal with these critically ill cardiac patients This new updated edition of the textbook continues to comprehensively approach all the different issues relating to intensive and acute cardiovascular care and addresses all those involved in intensive and acute cardiac care not only cardiologists but also critical care specialists emergency physicians and healthcare professionals The chapters cover the various acute cardiovascular diseases that need high quality intensive treatment as well as organisational issues cooperation among professionals and interaction with other specialities in medicine SECTION 1 focusses on the definition structure organisation and function of ICCU s ethical issues and quality of care SECTION 2 addresses the pre hospital and immediate in hospital ED emergency cardiac care SECTIONS 3 5 discuss patient monitoring diagnosis and specific procedures Acute coronary syndromes ACS acute decompensated heart failure ADHF and serious arrhythmias form SECTIONS 6 8 The main other cardiovascular acute conditions are grouped in SECTION 9 Finally SECTION 10 is dedicated to the many concomitant acute non cardiovascular conditions that contribute to the patients case mix in ICCU This edition includes new chapters such as low cardiac output states and cardiogenic shock and pacemaker and ICDs troubleshooting and chapters have been extensively revised Purchasers of the print edition will also receive an access code to access the online version of the textbook which includes additional figures tables and videos to better to better illustrate diagnostic and therapeutic techniques and procedures in IACC The third edition of the ESC Textbook of Intensive and Acute Cardiovascular Care will establish a common basis of knowledge and a uniform and improved quality of care across the field Clinical Nephrology, 2010 **Renal Failure and Replacement Therapies**

Sara Blakeley, 2007-12-03 Increased recognition of the overlap between critical care and renal medicine and recent advances in the understanding of acute renal failure and the application of renal replacement therapies have brought increased attention to the nephrologist s role in the intensive care unit ICU This book is written to provide an approach for the resident in nephrology at any level of training with regards to critically ill patients This text provides the information necessary to provide care for the nephrology patient in the ICU Critical Care Emergency Medicine, Second Edition David A.

Farcy, William C. Chiu, John P. Marshall, Tiffany M. Osborn, 2016-11-05 The groundbreaking text on critical care emergency medicine updated with the latest evidence and recommendations A Doody s Core Title for 2024 2021 Critical Care Emergency Medicine has become the standard reference for all clinicians who wish to understand the overlap between emergency medicine and critical care Much like the field of emergency medicine itself this text is a collaborative effort involving emergency physicians as well as clinicians from trauma critical care infectious diseases and pulmonary medicine

Critical Care Emergency Medicine teaches emergency physicians everything they must know and do to better care for critically ill patients in an emergency department or to provide care in an ICU Enhanced by numerous algorithms that speed decision making and full color illustrations demonstrating anatomy and technique this book is an essential practice tool Incorporating the wisdom of both academic and community emergency medicine experts Critical Care Emergency Medicine Second Edition delivers expert coverage of Airway and Ventilatory Support Pulmonary Disorders Cardiovascular Disorders Gastrointestinal and Renal Disorders Neurologic and Neurosurgical Disorders Hematologic and Endocrine Disorders Infectious Disorders Toxicologic Conditions Ultrasonography in Critical Care Special Considerations including nutritional support end of life issues fluid management and more If you are looking for an up to date evidence based text designed to take your critical care to the next level your search ends here

Principles and Practice of Hospital Medicine, Second Edition Sylvia C. McKean, John J. Ross, Daniel D. Dressler, Danielle Scheurer, 2016-10-22 The leading textbook of hospital medicine completely updated to reflect today's challenges A Doody's Core Title for 2021 Since its publication in 2012 Principles and Practice of Hospital Medicine Second Edition has become the field's premier resource Comprehensive authoritative and practical this landmark text provides a solid grounding in clinical organizational and administrative areas central to the practice of hospital medicine The Second Edition has been completely updated to reflect the evolving practice responsibilities of hospitalists Examples include value based medicine expanded surgical content bedside clinical reasoning and a new segment devoted to rehabilitation and skilled nursing care This edition also features a more accessible and streamlined full color design enriched by more than 600 illustrations Each clinical chapter opens with boxed Key Clinical Questions that are addressed in the text and summarized in hundreds of tables Case studies demonstrate how to apply this information specifically to the management of hospitalized patients Representing the expertise of more than two hundred renowned contributors Principles and Practice of Hospital Medicine Second Edition is logically divided into six sections The Specialty of Hospital Medicine and Systems of Care Medical Consultation Rehabilitation and Skilled Nursing Care The Approach to the Patient at the Bedside Diagnostic Testing and Procedures Clinical Conditions in the Inpatient Setting Principles and Practice of Hospital Medicine Second Edition is essential reading for clinicians who strive to optimize inpatient care and sharpen their leadership skills

American Journal of Respiratory and Critical Care Medicine, 2002

Sepsis and Multiple Organ Dysfunction Edwin A. Deitch, J. L. Vincent, Alastair Windsor, 2002 This is the definitive gold standard text on sepsis and multiple organ dysfunction It is comprehensive and thoroughly referenced the one text in which all current knowledge on this important topic is brought together The book is written by a team of international contributors overseen by an internationally acclaimed editorial team

Pediatric and Neonatal Tests and Procedures H. William Taeusch, Robert O. Christiansen, E. Stephen Buescher, 1996 Covering the major pediatric and pediatric surgical subspecialties this text thoroughly discusses common methods and procedures needed in the field of pediatrics It includes sections on body

systems such as cardiovascular pulmonary CNS eyes ears nose throat fluid metabolic renal gastrointestinal endocrine hematological and musculoskeletal it also focuses on common lab techniques clinical data management trauma and more

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