



CHAPTER 1

Intensive and acute cardiovascular care: an introduction

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Cardiovascular diseases (CVDs) are a major cause of premature death worldwide and an important cause of loss of disability-adjusted life years [1]. For most types of CVD, early diagnosis (within minutes) 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 [2].

Desmond Julian was the first to suggest the concept of the coronary care unit (CCU) to the British Cardiothoracic Society in 1961 [3]—an innovation widely recognized as one of the great developments in cardiology. In 1962, he set up the first CCU for the monitoring of patients with acute myocardial infarction (AMI) in Sydney (Australia), and in 1964 he established the first European CCU in Edinburgh. A few years later, Killip and Kimball demonstrated that ‘aggressive’ pharmacological therapy in a CCU could significantly reduce mortality (from 28% to 7%) in AMI patients without shock [4]. Since the inception of the intensive cardiovascular care unit (ICCU) in the early 1960s, the patient mix has drastically evolved [2, 3]. Due to the ageing population, growing medical complexity of treated patients, and improved survival from complex cardiovascular and medical conditions, patients with advanced cardiac disease complicated by severe non-cardiovascular comorbidities [e.g. sepsis or kidney injury in a patient on extracorporeal membrane oxygenation (ECMO)] have become increasingly common in the ICCU [5–7]. In concert, due to advances in procedural techniques, patients with severe non-cardiovascular illness complicated by secondary cardiovascular comorbidities [e.g. type II myocardial infarction (MI) or septic cardiomyopathy] are also growing in prevalence in the ICCU environment. Hospitalizations complicated by multiorgan failure (MOF) are frequent, while patient admissions with isolated primary cardiac dysfunction [e.g. acute coronary syndrome (ACS), arrhythmias] are becoming less common [2].

As a result, this environment led to the emergence of the cardiac intensivist, who should be trained in intensive care medicine and emergency medicine, as well as internal medicine and cardiology [2, 5, 7, 8].

The actual intensive and acute cardiovascular care (IACC) model makes the patient the centre of care, with continuous management by a core team of acute cardiovascular physicians and nurses—all in collaboration with cardiologists, cardiovascular surgeons, and affiliated health care workers [2]. Strategic planning of a patient’s diagnosis and management over the course of a hospitalization is grounded in multidisciplinary discussion, giving patients the benefit of not only the full spectrum of a hospital’s resources (an additive benefit), but also the wisdom of multidisciplinary deliberation (a multiplicative benefit greater than the sum of its parts) [9].

The Association for Acute Cardiovascular Care (ACVC) of the European Society of Cardiology (ESC) has been at the forefront of establishing best practice in acute cardiac and intensive care, first as a working group and subsequently, from 2012 onwards, as an association. The ACVC promotes research and education and spreads knowledge of new and emerging science in the field of acute cardiac care. The *ESC Textbook of IACC*, third edition, follows the IACC training core curriculum (CC) and is designed to be used as a text of teaching and a guide for learning. The chapters also serve as basis for the European Society of Cardiology of e-Learning (ESCeL) teaching modules. It is sufficiently large in scope to provide an overview of important areas related to acute cardiovascular care (ACVC) and makes it relevant to both trainees and non-trainees in cardiology, emergency and intensive care medicine, and beyond.

Section I focuses on the definition, structure, organization, and function of ICCUs and on ethical issues and quality of care.

Section II addresses the pre-hospital and immediate in-hospital [emergency department (ED)] emergency cardiac care.

In Sections II–V, patient monitoring, diagnosis, and specific procedures are described. Laboratory medicine is widely used in IACC, both for prompt diagnosis of acute conditions and for prognostic stratification, which frequently drives patient allocation and treatment strategies.

ACS, acute decompensated heart failure (ADHF), and serious arrhythmias deserve a whole section each, being the three most important groups of cardiac diseases managed in ICCUs (Sections VI–VIII). These entities are dealt with in great detail, including

pharmacological and non-pharmacological treatments. The other main cardiovascular acute conditions are grouped in Section IX.

Last, but not least, Section X is dedicated to the many concomitant acute non-cardiovascular conditions that contribute to the patient case mix in the ICCU. The acute and intensive management of this variety of acute illnesses requires deep and, at the same time, wide clinical training in all aspects of critical care.

The *ESC Textbook of Intensive and Acute Cardiovascular Care*, third edition, contains in total two brand new chapters: Chapter 47 (Low cardiac output states and cardiogenic shock) and Chapter 55 (Pacemakers and ICDs: troubleshooting). More than one-third of all chapters have benefited a major revision.

As in the previous editions, each chapter has been written by a real expert in the field and is in line with the ESC guidelines and the CC in IACC; multiple choice questions (MCQs) on many of the chapters are available for continuing medical education (CME). A particular asset of this textbook is the *online edition* (available at: <http://...>). Purchasers of the print, as well as of the online-only bundle, can access the online material via an access code. The online version contains all the material from the printed book, as well as many more figures and tables, an extended reference list for each chapter, and original material like photos and videos, to better illustrate diagnostic and therapeutic techniques and procedures in IACC.

We believe that this textbook will be very useful in establishing a common basis of knowledge and a uniform and improved quality of care in all European countries and beyond, for the benefit and improved care of our patients. Enjoy the reading!

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