

## Preface

# Emergency Cardiology: Challenges, Controversies, and Advances



William J. Brady, MD



Wyatt W. Decker, MD  
*Guest Editors*



Amal Mattu, MD

The emergency physician faces significant clinical challenges on a regular basis. One particular area of clinical challenge concerns cardiovascular emergencies, ranging from the patient with acute myocardial infarction (AMI) complicated by bradycardia to the child with respiratory failure due to a congenital heart lesion. The dyspneic patient with bradycardia and pulmonary congestion: cardiotoxic ingestion or acute coronary syndrome? The chest pain patient with the left bundle branch block electrocardiogram (ECG) pattern: AMI or noncoronary presentation? The cyanotic neonate with tachycardia: sepsis or congenital heart defect? The elderly patient with back pain presenting in shock: abdominal aortic aneurysm or pyelonephritis? The middle-aged female with headache and elevated blood pressure: a hypertensive emergency or elevated blood pressure due to cephalgia? These scenarios depict only a few diagnostic cardiovascular challenges encountered daily by the emergency physician. The most appropriate diagnostic and therapeutic approach to the patient in these and other cardiovascular presentations is constantly changing as research continues to improve emergency cardiovascular care.

The patient with acute coronary syndrome (ACS) represents numerous challenges to the emergency physician. Clearly, the diagnosis of ACS is a daily challenge; numerous obstacles are encountered by the clinician, including atypical histories, confounding ECG patterns, and equivocal

serum marker results. Advanced cardiac imaging in various forms is available in many settings, yet which investigation is most appropriate for your patient? Exercise stress testing? Stress echocardiography? Nuclear imaging? Or a combination of these methods? During the past 30 years, considerable effort has been made to improve the diagnostic evaluation of ACS. While much information is still contained within the ECG, computer-assisted and artificial intelligence algorithms have been developed to improve the diagnostic accuracy of the clinician. New, more sensitive, and more specific serum markers for myocyte injury have been developed and now play a central role in the diagnosis and risk stratification for ACS. Diagnostic tools such as echocardiography, stress testing, nuclear imaging, and the chest pain center continue to be studied for their use in effectively and safely evaluating and treating the chest pain patient with possible ACS in the emergent setting.

Once the diagnosis is established, additional questions surface. Fibrinolytic therapy and interventional, catheter-based techniques have revolutionized treatment of patients with ST segment elevation AMI (STEMI) during the 1980s. Recent work has focused on optimizing strategies, both pharmacologic and interventional, as well as expanding treatment options for Non-ST segment elevation AMI (NSTEMI) and unstable angina patients. Combination therapies with antiplatelet, antithrombotic, and fibrinolytic agents continue to be studied for STEMI patients. Interventional success has improved with the use of newer stenting devices and glycoprotein platelet inhibitors. Efforts to both establish regional cardiac centers as well as expand interventional capabilities to smaller hospitals have focused on improving timely, appropriate care for more AMI patients. This revolution in acute reperfusion therapy has made early diagnosis, as well as rapid treatment, a substantial challenge for the clinician.

Beyond the ACS presentation, numerous other cardiovascular presentations are reviewed. Toxin-mediated syndromes, such as cocaine and other cardiotoxins, are reviewed with particular emphasis on bedside diagnosis and toxin-specific therapies. Innovative therapies in pulmonary edema are suggested—treatment approaches that challenge age-old management strategies in the patient who has acute congestive heart failure. Atrial fibrillation, a common arrhythmia in the emergency department (ED), is reviewed with a focus on the most appropriate management strategies for the emergency physician: rate control versus rhythm conversion. The dilemma of hypertension in the ED (ie, When is it emergent? Urgent? Uncomplicated?) is addressed. Aortic disasters in the elderly patient and cardiovascular presentations in the child are also reviewed, rounding out the extremes of patient age in the ED population.

In this issue of the *Emergency Medicine Clinics of North America*, we have assembled a list of knowledgeable emergency physicians who have authored

timely and focused reviews in these various areas of cardiovascular emergency care. These reviews address the central clinical issues with an emphasis on “what you need to know” to appropriately manage patients in the ED.

William J. Brady, MD

*3020 Cove Lane*

*Charlottesville, VA 22911, USA*

*E-mail address: [wb4z@hscmail.mcc.virginia.edu](mailto:wb4z@hscmail.mcc.virginia.edu)*

Wyatt W. Decker, MD

*Mayo Clinic*

*200 First Street SW*

*Rochester, MN 55905, USA*

*E-mail address: [decker.wyatt@mayo.edu](mailto:decker.wyatt@mayo.edu)*

Amal Mattu, MD

*Department of Emergency Medicine*

*110 South Paca Street*

*Sixth Floor, Suite 200*

*Baltimore, MD 21201, USA*

*E-mail address: [amalmattu@comcast.net](mailto:amalmattu@comcast.net)*