Primary Angioplasty in Acute Myocardial Infarction
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Second Edition
The past 50 years have witnessed a breathtaking evolution in the approaches to the patient with an acute ST elevation myocardial infarction. In the 1960s, the now commonplace cardiac intensive care unit was but a nascent idea. Without much to offer the patient but weeks of absolute bedrest, substantial morbidity and high rates of mortality were the norm. Just 30 years ago, seminal discoveries by DeWood and colleagues suggested that the culprit was plaque rupture with thrombosis, not progressive luminal compromise. Subsequent fibrinolytic-based strategies resulted in a halving of the mortality of acute myocardial infarction. With the introduction of balloon angioplasty in the late 1970s, a few interventional cardiologists braved the question: why not perform emergency angioplasty as a primary reperfusion strategy? Indeed, reports of successful reperfusion via balloon angioplasty appeared (mostly in local newspapers) as early as 1980. Despite being thought of as heretical by mainstream cardiology, these pioneers nonetheless persevered, proving the benefit of “state-of-the-art” balloon angioplasty compared with “state-of-the-art” thrombolytic therapy in a series of landmark trials published in the New England Journal of Medicine in March of 1993.

Publication of the first edition of Primary Angioplasty in Acute Myocardial Infarction in 2002 to some extent anticipated the widespread acceptance of primary percutaneous coronary intervention as the standard of care. Since then, in all respects, the evolution of emergency percutaneous revascularization has only accelerated. The universal replacement of balloon angioplasty with stent implantation was clearly one key. But to put this edition in context, it was after the publication of the first edition that the findings of the DANAMI 2 (Danish Multicenter Randomized Study on Fibrinolytic Therapy versus Acute Coronary Angioplasty in Acute Myocardial Infarction) and the PRAGUE 2 (Primary Angioplasty in Acute Myocardial Infarction Patients from General Community Hospitals Transported for Percutaneous Transluminal Coronary Angioplasty Units Versus Emergency Thrombolysis), trials affirmed that emergency intervention still resulted in better outcomes than fibrinolytic therapy, even when transfer was required from a “first responder” hospital to a tertiary referral center. A multitude of additional studies have further refined our knowledge and strategies. Indeed, the question of whether to
implant a stent during acute coronary intervention seems like ancient history; even the moniker “angioplasty” feels dated.

It is both an honor and a pleasure to bring together in this edition the latest concepts and information about this lifesaving approach. The evidence for primary coronary intervention as the standard of care of the patient sustaining an acute myocardial infarction, along with technical and system-related considerations for successfully accomplishing this procedure, is detailed in the first four chapters. These chapters describe requisite fundamentals for any primary angioplasty program. Chapters 5 and 6 tackle the complexities of reducing door to balloon time, covering options available to primary care hospitals without surgical backup and addressing local and regional system and process-related barriers to reperfusion. Chapters 7–10 survey the strategies frequently considered in contemporary practice and include both beneficial findings and negative results that may potentially challenge old habits. A glimpse of the future is provided in Chapter 11, an overview of cell therapies targeting the regeneration of myocardium following cell death secondary to acute myocardial infarction. The final chapter reviews the economics of this approach, particularly critical in our resource-constrained health care environment.

I am grateful to my colleagues, the authors of the chapters of this edition, for their willingness to share their knowledge, experiences, research, and insights. In an age where free time is ever diminishing, it is a tribute to their dedication to the highest quality clinical care that they were willing to spend so much time putting pen to paper (or fingers to keyboard) so that we could all benefit. I would also like to extend a special note of thanks to Joyce Sizemore for her skillful administrative assistance. Most importantly, I dedicate this book to my forever sweetheart, Marianne Powers, without whose patience, understanding, and love this project could not have been accomplished.

Durham, NC

James E. Tcheng
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