

# **HAMMERSMITH CARDIOLOGY WORKSHOP SERIES**

**VOLUME 3**

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# Hammersmith Cardiology Workshop Series

## *Volume 3*

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## Preface to the Series

New data and new concepts appear in the medical literature at an ever-increasing rate. Physicians face the difficult task of the overall synthesis of this growing volume of information and not infrequently are presented with conflicting but apparently authoritative views on various topics.

This European and American Cardiology Series has accepted the challenge of following the exciting developments in cardiology and its related disciplines by bringing together, in a public forum, leading authorities from both sides of the ocean who present and discuss the most relevant advances and controversial aspects of cardiovascular research and clinical practice.

The salient feature of the course is the considerable time reserved for discussion after each presentation and at the end of each session. The lively exchange of opinions among speakers, discussants, and audience provides a unique opportunity for perceiving the areas of consensus and for developing a balanced view of controversial issues.

This series gives an account of the presentations of invited speakers, a précis of the discussion, and an editorial view of both. The reports of the presentations of the speakers constitute a synthesis of new data or personal views of complex issues. The debate among invited speakers, discussants, and audience is summarized, highlighting unresolved issues and those where new agreement has been reached. The editorial comment is separately presented in an attempt to steer the reader through these difficult areas.

It is intended that "European and American Cardiology at the Hammersmith" will be an annual event and the proceedings will be published yearly.

## Preface to Volume 3

This volume of the Hammersmith Cardiology Workshop Series presents the proceedings of the third European and American Cardiology Course at the Hammersmith and is devoted to advances and controversies in ischemic heart disease.

The first part of the course covered the mechanisms of ischemic cardiac pain, the significance of painless ischemia, and the various mechanisms of dynamic stenosis and coronary occlusion in infarction. The central part of the course ranged from techniques used in detecting myocardial ischemia, to coronary thrombolysis, to antiplatelet and anticoagulant therapy, to an update of organization and policies in coronary care units. The final part of the course covered the determinants of prognosis in ischemic heart disease and the results of medical treatment of coronary surgery and angioplasty.

This volume, like the previous two, has no pretensions of providing comprehensive reviews. Rather, it offers a series of introductory lectures particularly chosen to stimulate discussion. The précis of the discussions and the editorial comments that follow each section give an account of consensus or disagreement in controversial areas among world authorities.

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# Afferent Nervous Impulses During Acute Myocardial Ischemia

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The afferent fibers running in the cardiac sympathetic nerves are generally considered the only essential pathway for the transmission of cardiac pain. This concept has arisen from observing that a high thoracic sympathectomy was able to induce surgical relief of anginal pain in humans (12) or the abolition of animal reactions, suggestive of pain, accompanying coronary occlusion (10).

Almost two decades have elapsed since electrophysiological investigations into the properties of afferent sympathetic cardiac fibers have started to afford direct evidence on the nature of the stimuli capable of exciting them (1,6). Cardiac sympathetic afferent fibers have a tonic impulse activity and subserve cardiovascular reflexes that are mainly excitatory in nature (1,6). I shall restrict my analysis to the properties of ventricular sympathetic afferent fibers (either small myelinated or unmyelinated), that is, the afferent fibers that are most likely to convey cardiac nociception.

## VENTRICULAR SYMPATHETIC AFFERENT FIBERS

It now seems established that these ventricular receptors always possess some mechanosensitivity that attributes to their fibers some degree of spontaneous impulse activity (if the hemodynamic conditions are in the normal range) and a responsiveness to normal hemodynamic events (1,6). In addition, these afferent fibers are also markedly excited by bradykinin or other chemical substances (4-8), thus displaying properties of "polymodal" receptors, a term indicating that the receptive zone is considered to be sensitive to both mechanical or chemical stimuli.

Coronary occlusion (2,6) or the administration of bradykinin (1,4,5), a natural algescic substance suspected to take part in the genesis of cardiac pain, markedly excited the ventricular sympathetic afferent fibers; however, a recruitment of silent afferent fibers could never be appreciated (5,7). In more explicit terms, these experimental findings negated the existence of a population of ventricular sympathetic afferent fibers normally devoid of a spontaneous impulse activity, being