

CARDIAC EMERGENCIES AND HEART FAILURE

Prevention and Treatment

BY

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*Second Edition, Thoroughly Revised
Illustrated*

LONDON

HENRY KIMPTON

25 BLOOMSBURY WAY, W.C.1

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Printed in America

PREFACE TO THE SECOND EDITION

DURING the past three years numerous advances have been made in cardiology and a number of new drugs have been introduced for the treatment of cardiac emergencies. In presenting this revision of the original text, those newer therapies have been stressed which, in our opinion, have proven successful and will continue to be utilized; procedures that appear promising but which have not yet stood the test of time are discussed only briefly. The chapters on congestive failure, arrhythmias, acute coronary disease, rheumatic heart disease and hypertensive crises have been enlarged or revised and case reports added to include newer concepts and to illustrate the use of drugs that have been recently introduced. The bibliography has been brought up to date and the index enlarged. Several charts and tables have been added in the section on arrhythmias. The book has been kept at "pocket size" so that the physician may have it available for use at all times, even at the bedside. As in the first edition, cases have been added from the authors' private practices and from the wards of the Mount Sinai Hospital. We are most grateful to our wives who gave us unceasing assistance in the preparation of this book.

New York. N.Y.

ARTHUR M. MASTER

MARVIN MOSER

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PREFACE TO THE FIRST EDITION

THE prompt diagnosis of cardiovascular emergencies and their proper treatment are among the most common problems confronting the general practitioner. This monograph has been written in the hope that it will be of value to him as he encounters these acute conditions. It is not intended to be a book on Cardiology, Radiology or Electrocardiography; consequently, it does not cover these fields as thoroughly as do the standard textbooks. Physiology and pathology are discussed when a fuller understanding of them is considered necessary for the intelligent handling of cardiac patients. The drugs that have been found valuable are stressed; other drugs in current use are discussed. Case histories are presented to illustrate specific conditions and the use of the newer drugs. Throughout the book, the importance of preventing cardiac emergencies by adequate interval therapy is emphasized.

We have included sections on surgical cardiac emergencies, on cardiac resuscitation and on certain acute conditions that are not commonly encountered, *i.e.*, dissecting aneurysm, hypertensive crises secondary to pheochromocytoma, and the acute episode resulting from a "ball valve" thrombus, in the hope that when these emergencies are seen they may be recognized and treated properly.

The section on congestive heart failure and its complications is brief, but we have included all of the information

that we believe is necessary for the treatment of this condition.

We have surveyed the literature, but have drawn freely from our own cases and experience, as well as from material previously published by one of us (A.M.M.). Portions of this monograph have been presented in several broadcasts sponsored by the New York Academy of Medicine over Station WNYC (FM).

We wish to thank Dr. Samuel Kahn and Dr. Phillip Samet for editorial assistance. We are indebted to members of the cardiographic department of the Mount Sinai Hospital for valuable suggestions.

We hope that the great number of physicians who are called upon to diagnose and treat the diseases that we discuss will benefit from this work.

New York, N.Y.

A. M. M.

M. M.

H. L. J.

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Cardiac Emergencies and Heart Failure

INTRODUCTION

As a result of the tremendous advances in the prevention and treatment of many diseases, and of the increased span of life, cardiovascular disease now greatly outnumbers all others and causes more than half the deaths after the age of fifty. Acute heart conditions require emergency treatment more than do those of any other organ, making the term "acute heart" even more appropriate than the expression "acute abdomen." The prompt treatment of acute cardiac disease by the application of well-established rules, and the utilization of recent advances in the field of cardiology will save many lives and hasten recovery in others. Since treatment must be immediate, it is incumbent upon the physician to know how to diagnose and treat cardiac emergencies, and to have the essential drugs readily available. This requires the careful selection and constant replenishment of medical supplies, for it is very disheartening to make the correct diagnosis of a cardiac emergency, and not to have the suitable medication available. The following material should always be present in the doctor's bag in adequate amount. Additional drugs, such as intravenous hexamethonium (Chapter 6), which are generally reserved for hospital use, need not be carried but should be available in a hospital.

1. Aminophyllin, ampules, 10 cc. = .24 gm. for i.v. use,
2 cc. = .48 gm. for i.m. use.

2. Atropine Sulfate, .75 mg. (gr. 1/100) hypodermic tablets for i.v. use.
3. Cedilanid (Lanatoside C), 4 cc. (.8 mg.) and 2 cc. (.4 mg.) ampules for i.v. or i.m. use.
4. Demerol, 2 cc. (100 mg.) ampules, or multiple dose vials (1 cc. = 50 mg.).
5. Digoxin, .25 mg. tablets or Gitaligin, .5 mg. tablets.
6. Epinephrine 1:1000 (1 cc. ampules).
7. Isuprel, 10 mg. linguets.
8. Mercurial Diuretic (Mercuryhydrin or Thiomerin) 1 or 2 cc.
9. Morphine Sulfate, 16 mg. ($\frac{1}{4}$ gr.) tablets for i.m. or i.v. use.
10. Needles for phlebotomy.
11. Neosynephrin, 1 cc. = 10 mg., for i.v. or i.m. use.
12. Nitroglycerin hypodermic tablets, gr. 1/200. or gr. 1/150.
13. Pronestyl (Procaine Amide), 10 cc. ampules (1 cc. = 100 mg.) and 250 mg. tablets.
14. Quinidine, 1 cc. ampule = .2 gm. for i.m. use, .2 gm. (3 gr.) tablets.
15. Sterile water for dilution of tablets.
16. Ouabain (G Strophanthin) 2 cc. ampules = .5 mg., or Strophanthin K ("Strophosid"), 1 cc. ampule = .5 mg.
17. Thorazine, 1 cc. = 25 mg. for i.m. use, 10 or 25 mg. tablets or Dramamine, 50 mg. tablets; 10 cc. ampules (1 cc. = 50 mg.)
18. Tourniquets.
19. Vasoxyl, 1 cc. = 25 mg., or Wyamine, 1 cc. = 15 mg. for i.v. or i.m. use.

Chapter

1

ARRHYTHMIAS

A CHANGE in the rate or rhythm of the heart is a common cause of acute distress in patients with and without cardiac disease. Even in a patient with a normal heart, an arrhythmia may produce symptoms of anxiety, precordial aching or severe pain,³³⁸ vertigo, syncope, vomiting, collapse, and rarely congestive heart failure.¹²⁵ Severe circulatory derangements occur following the onset of arrhythmias with a rapid rate, *i.e.*, the paroxysmal tachycardias, or a slow rate, *i. e.*, complete A-V block. This is especially true in elderly people.

PAROXYSMAL TACHYCARDIA

The paroxysmal tachycardias include atrial flutter and fibrillation, atrial, nodal, and ventricular tachycardia and ventricular fibrillation. (The term "atrial" is to be preferred to "auricular" since the cardiac pacemakers are located in the atrium and not in the appendage (auricle). Any of the tachycardias may remit spontaneously within several hours and cause no disturbance, but they may produce severe symptoms and marked effects on circulatory dynamics. The clinical severity of any arrhythmia is usually proportional to the increase in the ventricular rate. It has been demonstrated that a change in heart rate from 70 or 80 to one of 120 or 130 usually increases minute volume output. This occurs despite the fact that ventricular filling and stroke volume may be decreased. (The cardiac output,

which is the product of heart rate and stroke output, actually increases.) With further increases in cardiac rate, total minute volume is reduced.¹³⁹ This may result in severe cerebral anoxia with fainting or convulsions. For example: J.C., a thirty-two-year-old factory manager studied by us, fainted on several occasions. He gave a long history of discomfort whenever he wore a tie, and his pulse slowed moderately on carotid sinus pressure. The fainting was, therefore, considered to be the result of bradycardia caused by carotid sinus hypersensitivity. Close questioning, however, revealed that the syncope was preceded by palpitations, and he was later seen during an episode of nodal tachycardia. This was probably the major cause of his fainting, although the carotid sinus may also have played a role.

If tachycardia persists, it may result in a further decrease in cardiac output and the clinical picture of shock, cardiac failure,³⁰⁹ and/or coronary insufficiency with chest pain and RS-T and T-wave changes in the electrocardiogram. A patient demonstrating this syndrome was a sixty-five-year-old woman with carcinoma of the left lung and hemothorax who was receiving nitrogen mustard therapy. On the fifth day after therapy she suddenly experienced precordial pain and palpitation and went into shock. Her heart rate was 180, and an electrocardiogram revealed a 2:1 atrial flutter with RS-T depressions in all leads. While the cardiogram was being taken, the rhythm reverted to normal sinus rhythm but the RS-T depressions persisted for several minutes. In some instances RS-T depressions persist for hours or days.

THE SUPRAVENTRICULAR TACHYCARDIAS

Supraventricular tachycardias, i.e., atrial or nodal tachycardia and atrial flutter and fibrillation, occur in persons with normal or abnormal hearts,^{43,175} and may be precipi-