

Clinical Thrombosis

Editors

Hau C. Kwaan, M.D., F.R.C.P.(Ed.), F.A.C.P.

Professor of Medicine
Department of Medicine
Northwestern University Medical School, and
Chief, Hematology/Oncology Section
Veterans Administration
Lakeside Medical Center
Chicago, Illinois

Meyer M. Samama, M.D.

Professor of Hematology
Chief, Laboratory of Hematology and
Director, Laboratory of Experimental
Thrombosis
Hotel-Dieu Hospital
Paris, France



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EDITORS

Hau C. Kwaan, M.D., F.R.C.P. (Ed.), F.A.C.P., is Professor of Medicine, Northwestern University Medical School, Chief of the Hematology/Oncology Section of the Veterans Administration Lakeside Medical Center and Attending Physician at the Northwestern McGaw Medical Center in Chicago, Illinois.

Dr. Kwaan received his medical education at the University of Hong Kong and graduated in 1952. He received further post-graduate training at the Royal Infirmary of Edinburgh, Royal Infirmary of Glasgow, and the University of London (cardiology at National Heart Hospital, London, and neurology at National Hospital, Queen's Square, London) from 1957 to 1958. He was a China Medical Board Research Fellow at Columbia University College of Physicians and Surgeons, New York, in 1958, and Senior Lecturer at the James F. Mitchell Foundation Institute for Medical Research, Washington, D.C. and Georgetown University School of Medicine, Washington, D.C. until 1966 when he joined the Northwestern University Medical Center. He was certified in internal medicine with a hematology subspecialty by the Royal College of Physicians of Edinburgh, Scotland in 1958, and by the American Board of Internal Medicine in 1969, and recertified in 1977. He was certified in hematology in 1974 and oncology in 1979.

Dr. Kwaan was awarded the China Medical Board Fellowship at Columbia University in 1958, the Senior Fulbright Traveling Professorship at the University of Tasmania, Australia in 1974, and was the recipient of the Elwood A. Sharp Award at Wayne State University, the Distinguished Service Award of the Department of Medicine at Northwestern University, and Visiting Scholar Award of the China Institute in America, Inc. to lecture in the People's Republic of China. He has served on the Thrombosis Advisory Committee of the National Institutes of Health, the Executive Committee of the American Heart Association's Thrombosis Council, Assessors Panel of the National Health and Medical Research Council of Australia, Research Committee of the Chicago Heart Association, and Subcommittee on Standards of the International Committee on Hemostasis and Thrombosis. He is a member of the Eastern Oncology Study Group and a member of the Blood Diseases and Resources Advisory Committee of the National Heart, Lung and Blood Advisory Council of the National Institutes of Health.

Dr. Kwaan is the author of over 200 scientific publications and various chapters in books in the fields of thrombosis, hematology, and oncology and is also the principal editor of the textbook *Thrombosis*. His current major research interests include the role of fibrinolysis in tumor growth and metastasis, thrombolytic therapy, the etiology of thrombotic microangiopathy, and other topics in thrombosis.

Meyer-Michel Samama, M.D., is Professor of Hematology, Chief of the Laboratory of Hematology at the Hotel-Dieu Hospital, and the Director of the Laboratory of Experimental Thrombosis of the Faculty of Medicine in Paris (University Paris VI).

Dr. Samama obtained his degree of Pharmacist-Biochemist in 1951 in Paris, received his medical training at the Broussais-Hotel-Dieu University in Paris, and obtained his M.D. degree in 1968. In 1971 he became Associate Professor of Hematology and assumed his present position as the Director of the Laboratory of Hematology at the Hotel-Dieu University Hospital in Paris. He became a full Professor in 1981.

His main interest is in hematology with a specialty in hemostasis. His research work and interest in hemostasis and thrombosis started in 1955, and he has become an expert in the field of antithrombotic drugs.

His main contributions to this field concern congenital and acquired dysfibrinogenemia, congenital deficiencies of Proteins C and S, hypofibrinolysis and thrombosis, thrombolytic and antithrombotic drugs, and a recent interest in low molecular weight heparins.

Dr. Samama is presently the President of the French Group on Thrombosis and Hemostasis and the Chairman of the Council of the Fibrinolysis Study Group and he has served as President of the Mediterranean League against Thrombosis. He is also a member of the Council of the International Society of Thrombosis and Hemostasis. He has been active on the editorial boards of several medical journals, including *Hemostasis and Thrombosis Research*.

From 1969 to 1979 an average of 25 papers per year, including general reviews, were published by M. M. Samama and his group. During recent years this number has increased about twofold.

He and his group have authored over 50 original published papers during the last three years in the field of thrombosis and hemostasis and he has co-authored several books and proceedings of scientific meetings.

CONTRIBUTORS

Jean Acar, M.D.

Department of Cardiology
Hôpital Tenon
Paris, France

Lina Badimon, Ph.D.

Associate Professor of Medicine
Division of Cardiology
Department of Medicine
Mount Sinai Medical Center
New York, New York

Julian E. Bailes, M.D.

Department of Neurosurgery
Allegheny General Hospital
Pittsburgh, Pennsylvania

Jacques Berdah, M.D.

Department of Cardiology
Hôpital Tenon
Paris, France

John J. Bergan, M.D.

Clinical Professor of Surgery
University of California,
San Diego, California, and
Magerstadt Professor of Surgery,
Emeritus
Northwestern University School of
Medicine
Chicago, Illinois

Loïc Capron, M.D.

Head
Department of Vascular Reeducation
Hôpital Broussais
Paris, France

Giuseppe Celli, M.D.

Institute of Semeiotic Medicine
University of Padua
Padua, Italy

Anne Chabanel, M.D.

Central Laboratory for Hematology
Hôpital Hotel-Dieu
Paris, France

James H. Chesebro, M.D.

Department of Medicine
Mayo Clinic School of Medicine
Rochester, Minnesota

Jacqueline Conard, M.D., Ph.D.

Central Laboratory for Hematology
Hôpital Hotel-Dieu
Paris, France

Ph. Darteville, M.D.

Department of Thoracic and Vascular
Surgery
Heart-Lung Transplantation
Marie Lannelongue Hôpital
Plessis Robinson, France

Pierre C. Desnoyers, Sc.D.

Central Laboratory for Hematology
Hôpital Hotel-Dieu
Paris, France

Paul Didisheim, M.D.

Head, Biomaterials Program
Devices and Technology Branch
Division of Heart and Vascular Diseases
National Heart, Lung, and Blood Institute
National Institutes of Health
Bethesda, Maryland

Gilbert Dimaria, M.D.

Professor
Department of Surgery
Hôpital Hotel-Dieu
Paris, France

Benjamin T. Esparaz, M.D.

Hematology/Oncology Section
Department of Medicine
Northwestern University Medical School
Chicago, Illinois

Valentin Fuster, M.D., Ph.D.

Chief, Division of Cardiology
Department of Medicine
Mount Sinai School of Medicine
New York, New York

Eric F. Grabowski, M.D., Sc.D.
Associate Professor of Pediatrics
Department of Pediatrics
Cornell University Medical Center
New York, New York

David Green, M.D., Ph.D.
Professor of Medicine
Department of Medicine
Northwestern University Medical School
Chicago, Illinois

Margaret W. Hilgartner, M.D.
Professor of Pediatrics
Department of Pediatrics
Cornell University Medical Center
New York, New York

Marie Helene Horellou, M.D.
Central Laboratory for Hematology
Hôpital Hotel-Dieu
Paris, France

**Russell D. Hull, F.R.A.C.P.,
M.B.B.S., F.R.C.P.(C.)**
Professor and Chief
Department of Medicine
McMaster University
Chedoke-McMaster Hospitals
Hamilton, Ontario, Canada

Douglas H. Israel, M.D.
Research Fellow in Cardiology
Department of Medicine
Mount Sinai School of Medicine
New York, New York

Thiti Jaojaroenkul, M.D.
Section Head, Grant Hospital of Chicago,
and
Assistant Professor
Department of Medicine
Rush Medical College
Chicago, Illinois

A. R. Kher, M.D.
Central Laboratory for Hematology
Hôpital Hotel-Dieu
Paris, France

Merrill S. Kies, M.D.
Associate Professor of Clinical Medicine
Section of Hematology and Oncology
Northwestern University Medical School
Chicago, Illinois

Ted R. Kohler, M.D.
Associate Professor
Department of Surgery
University of Washington School of
Medicine
Seattle, Washington

**Hau C. Kwaan, M.D., F.R.C.P.(Ed.),
F.A.C.P.**
Professor of Medicine
Department of Medicine
Northwestern University Medical School,
and
Chief, Hematology/Oncology Section
Veterans Administration Lakeside
Medical Center
Chicago, Illinois

T. Lecompte, M.D.
Central Laboratory for Hematology
Hôpital Hotel-Dieu
Paris, France

Michael Martin, M.D.
Professor of Medicine
Geriatric Hospital
City Clinics
Duisberg, West Germany

J. Marzelle, M.D.
Department of Thoracic and Vascular
Surgery
Heart-Lung Transplantation
Marie Lannelongue Hôpital
Plessis Robinson, France

P. L. Michel, M.D.
Department of Cardiology
Hôpital Tenon
Paris, France

Vincent T. Miller, M.D.
Assistant Professor of Neurology
Department of Neurology
Northwestern University Medical School
Chicago, Illinois

Albert A. Nemcek, Jr., M.D.

Assistant Professor of Clinical Radiology
Department of Diagnostic Radiology
Northwestern University Medical School
Chicago, Illinois

Genevieve Nguyen, M.D.

Central Laboratory for Hematology
Hôpital Hotel-Dieu
Paris, France

Antonio Palla, M.D.

Institute of Clinical Physiology, CNR
University of Pisa
Pisa, Italy

Matthew R. Quigley, M.D.

Department of Neurosurgery
Allegheny General Hospital
Pittsburgh, Pennsylvania

Gary E. Raskob, M.Sc.

Clinical Trial Specialist
Department of Medicine
McMaster University
Chedoke-McMaster Hospitals
Hamilton, Ontario, Canada

Meyer Michel Samama, M.D.

Professor of Hematology
Central Laboratory for Hematology
Hôpital Hotel-Dieu
Paris, France

Arthur A. Sasahara, M.D.

Venture Head, Thrombolytics Research
Abbott Laboratories
Abbott Park, Illinois, and
(on leave of absence from)
Department of Medicine
Brigham and Women's Hospital, and
Professor of Medicine
Harvard Medical School
Boston, Massachusetts

G. V. R. K. Sharma, M.D.

Acting Chief, Cardiology Section
Brockton/West Roxbury Veterans
Administration Medical Center, and
Associate Professor of Medicine
Harvard Medical School
Boston, Massachusetts

D. E. Strandness, Jr., M.D.

Head, Vascular Surgery Section
Department of Surgery
University of Washington School of
Medicine
Seattle, Washington

Chung-hsin Ts'ao, Ph.D.

Professor
Department of Pathology
Northwestern University Medical School
Chicago, Illinois

Robert L. Vogelzang, M.D.

Associate Professor of Clinical Radiology
Director, Angiography and Interventional Radiology
Department of Diagnostic Radiology
Northwestern Memorial Hospital
Chicago, Illinois

Malcolm V. Vye, M.D.

Assistant Professor of Pathology
Northwestern University Medical School, and
Director, Hematology and Coagulation Laboratory
Department of Pathology and Laboratory Medicine
Evanston Hospital
Evanston, Illinois

John T. Watson, M.D.

Chief, Devices and Technology Branch
Division of Heart and Vascular Diseases
National Heart, Lung, and Blood Institute
National Institutes of Health
Bethesda, Maryland

Carl P. Weiner, M.D.

Associate Professor
Director, Maternal-Fetal Medicine
Department of Obstetrics and Gynecology
University of Iowa College of Medicine
Iowa City, Iowa

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Introduction



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THROMBOSIS: A MULTIDISCIPLINARY APPROACH

Hau C. Kwaan and M. M. Samama

The life expectancy of a person born today compared to that of one born at the turn of the century has increased by over 50%. In the U.S., this has changed from 47.3 to 74.7 years.¹ However, such a gain occurred mostly in the first half of the century, so that for a person 25 years old today, the life-span improved by only about 5 additional years. This discrepancy is primarily due to the failure of adequate control of cardiovascular disease and cancer. In these two diseases, a major cause of morbidity and mortality is the occurrence of thrombosis or embolism. It has been estimated that the prevalence of thromboembolic disease is about five times that of malignant diseases.^{2,3} The actual incidence is difficult to assess due to its involvement of multiple organs. As such, it is attended to by physicians of many different disciplines. Because thrombosis and embolism are frequently considered as complicating events, they are not listed as actual diseases in discharge diagnoses or on death certificates. In the U.S. alone, an estimated 539,316 persons died in 1978 from "clotting disorders" ranging from cerebral thrombosis, myocardial infarction, arterial embolism, venous thrombosis, and pulmonary embolism; while 2,179,000 were hospitalized and 3,820,000 were treated in physicians' offices.⁴ The magnitude of this problem is reflected by the estimate of a total economic cost to the nation in 1979 of U.S. \$24,971,000,000. Similar data in western Europe showed the importance of increased prevalence of venous thrombosis and pulmonary embolism.^{5,6} An example of the growing importance of thrombosis in cardiovascular disease is reflected in the progressive increase in the incidence of coronary artery disease in the past 50 years, which cannot be explained solely on the basis of the atherosclerosis.^{7,8} Many recent studies confirmed that thrombogenesis contributes to coronary artery disease and to acute myocardial infarction.^{9,10}

With the recognition of thrombosis as a significant health care issue, there is a corresponding rapid advance in our understanding of the pathophysiology of many thromboembolic disorders. These advances involve workers in many disciplines of the biologic sciences ranging from the basic scientist to the clinical practitioner of medicine and surgery. A need for a textbook with information on this subject becomes apparent. This text is conceived by the editors as a venue to provide the basic scientist with pertinent clinical information on thromboembolic disorders, while at the same time also giving essential basic data for the clinicians. It is not intended to be an extensive research text for investigators in this field, since there are many excellent examples of such available today. Rather, it is aimed at providing the needed clinical information as well as the scientific basis for diagnosis and therapy of thromboembolic disorders with pertinent references on each topic given at the end of each chapter.

An example of the need for a multidisciplinary approach to thrombosis is seen in the increasing number of diagnostic tests available in the laboratory both for the investigation of thromboembolic disease as well as for the monitoring of antithrombotic treatment. A close interaction between the laboratory worker and the clinician is needed for the selection of the most appropriate tests. A meaningful interpretation of an abnormal value can only be achieved by a clear understanding of the tests chosen. In an era where health care costs are a major issue, the considerations for cost effectiveness again emphasize such a need. At the same time, we have seen a multitude of new therapeutic modalities and an ever-increasing number of therapeutic agents added to our pharmacopeia. The choice of an appropriate approach may indeed be a dilemma for the clinician, unless he has the essential information provided by the basic scientist and the pharmacologist. The final therapeutic decision has to come from the clinician, since he is the one with a first-hand knowledge of the patient's needs and, therefore, has to be the person who orchestrates the plan of management.

The organizational plan of this text takes into consideration that the reader may be in one of the many different disciplines. Consequently, an introductory chapter is devoted to the basic pathophysiology of the hemostatic mechanism; this is followed by a discussion on the important factors involved in the pathogenesis of thrombosis. Thereafter, the text is divided into sections dealing with: (1) the clinical features and characteristics of the more common thromboembolic disorders; (2) those patients with high risk for thromboembolism such as the obstetrical or cancer patient; (3) special diagnostic procedures including laboratory, angiographic, and noninvasive methods; and, finally, (4) pharmacologic and therapeutic considerations.

Contributors were selected by their expertise in the respective topics. Since each chapter is written by one or more different authors, there will be some unavoidable overlap in the coverage of certain subject matters. However, the editors have attempted to keep such overlap to a minimum. It is our fervent hope that this volume will be able to fulfill the needs of clinicians and basic scientists alike by providing the essential information on this rapidly advancing subject.

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3. **Vermeylen, J., Verstraete, M., and Fuster, V.**, Role of platelet activation and fibrin formation in thrombogenesis, *J. Am. Coll. Cardiol.*, 8, 2B, 1986.
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