COMPUTERS IN CARDIOLOGY

ISSN No.0276-6574

COMPUTERS IN CARDIOLOGY

September 23-25, 1981
Florence, Italy

IEEE Catalog No. 81CH1750-9
Library of Congress No. 80-691097
Computer Society No. 384
ISSN No. 0276-6574

Computers in cardiology / National Institutes of Health ... [et al.]
— Oct. 2-4, 1974- — Long Beach, Calif. : IEEE Computer Society, c1974-

v. : ill. ; 29 cm.

Annual.
ISSN 0276-6574 = Computers in cardiology.

1. Cardiology—Data processing—Congresses. 2. Patient monitoring—Data processing—Congresses. I. National Institutes of Health (U.S.) II. IEEE Computer Society.

RC683.3.D36C637 616.1'2'02854 80-641097
AACR 2 MARC-S

Library of Congress [8111]

Published by IEEE Computer Society Press
1109 Spring Street
Suite 201
Silver Spring, MD 20910

IEEE Catalog No. 81CH1750-9
Library of Congress No. 80-691097
Computer Society No. 384
ISSN No. 0276-6574

Order from: IEEE Computer Society
Post Office Box 80452
Worldway Postal Center
Los Angeles, CA 90080

IEEE Service Center
445 Hoes Lane
Piscataway, NJ 08854

The Institute of Electrical and Electronics Engineers, Inc.

CO-SPONSORS

National Research Council
Committee for Technological Development - Rome
Institute of Clinical Physiology
Pisa (Italy)

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INTRODUCTION

The eighth meeting of Computers In Cardiology, Our Octal Occasion, (CICOOO) seems a proper time to take stock. Have we made the progress that was envisioned at the founding meeting in 1974? Do we need to redirect our efforts or sharpen our objectives to reach our goals in 1984?

Two conclusions seem inescapable. Computers have become an integral part of cardiology as it is practiced in the great medical centers and yet it is true to say that computers remain peripheral to the mainstream of cardiological thought.

Diagnostic and monitoring techniques that utilize computers have changed the shape of our specialty. There *are* computers in cardiology and their ubiquity becomes more undeniable with each passing year. Today digital interpretation of electrocardiography and monitoring of physiological signals is taken for granted. Digital radiography and echocardiography are as near as the next generation of microelectronic circuits. We can feel confident that we are well on the way to wide scale digital acquisition of data for cardiology.

But is it reasonable to expect computers to be more than data gatheres for cardiology? Can we go beyond signal or image acquisition and processing? Can we reach that ideal expressed in 1974 "to let trend analysis guide the cardiologist's decisions"? Is this larger role one to which our field can, or still should aspire? We cannot answer these complex questions, but can report some observations which may be relevant.

The significant advance that computers have made in the diagnosis and treatment of cardiovascular disease makes the specialty a leader in the difficult task of integrating such new techniques into the autonomic nervous system of the discipline. Many new choices must now be made in the design of curricula and in the structure of departments of cardiology for the next decade.

In computer science excessively optimistic promises from workers in the subspecialty of artificial intelligence may have a damaging effect; some outside the subspecialty may accept the promises uncritically while others may dismiss them cynically. In fact, the fields of artificial intelligence, programming language theory and database models are converging toward results which may, within the decade, have far reaching significance for scientific inquiry in cardiology as well as other complex experimental sciences.

These developments parallel, changes in pathophysiologic concepts in cardiology, the vast increase in the therapeutic arsenal and the much more aggressive management of coronary artery disease, (killer #1 in the Western World) now underway. We can much better visualize how in the chain of decisions, from diagnosis to therapy, computers will, like mycelia of fungus, find their way into every branch of cardiology.

The wonders of new electronics have just begun. Methods being developed in the laboratory can reasonably lead, before the turn of the century, to production of 100,000,000 element chips with unimaginable computing power. Specialized processors for pattern recognition and image processing can be anticipated with speeds and resolution that would not be considered possible today.

These observations are diverse, but have a cumulative effect that will produce a further, qualitative, change in the role of computers in cardiology. The widespread teaching of the role that computers play in the acquisition of cardiovascular data, the developments within computer science that promise improved methods for the management of experimental and empirical data, the trends in cardiovascular research that lead to increased quantitation of disease processes, and the new opportunities in microelectronics all signal new opportunities. Does the sum of these opportunities represent a possible new level of involvement for computers in cardiology? Only time will tell, but you can probably guess the nature of our hunch.

Jerome R. Cox, Jr., Sc.D.
Paul G. Hugenholtz, M.D.
Co-Chairmen
COMPUTERS IN CARDIOLOGY

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ECHOCARDIOGRAPHY

CO-CHAIRMEN - P.G. Hugenholtz
Thoraxcentrum
Erasmus University
P.O. Box 1738
Rotterdam, The Netherlands

D.J. Skorton
Department of Internal Medicine
and the Cardiovascular Center and
Division of Materials Engineering
University of Iowa
Iowa City, Iowa 52242 USA