

“CONTRIBUTIONS OF SCIENCE AND TECHNOLOGY TO THE TREATMENT OF PATIENTS SUFFERING HEART ATTACKS”

Francis J. Klocke, M.D.
Department of Medicine
School of Medicine
Faculty of Health Sciences
Erie County Medical Center
Buffalo, New York

ABSTRACT

A heart attack is caused by the sudden blockage of a blood vessel nourishing the heart muscle. Two decades ago 30-40% of patients suffering heart attacks died within two weeks. Today that mortality figure has been reduced by a factor of three, largely due to contributions of modern science and technology. This presentation summarizes several of these contributions:

- 1) Continuous monitoring of the heart beat to detect disorders of heart rhythm which are life-threatening;
- 2) Treatment of these disorders with new drugs and with devices able to restore normal heart rhythm electrically (“cardioverters” and “defibrillators”);
- 3) Development of ultrasonic techniques for visualizing the chambers of the heart and evaluating the heart’s contraction non-invasively (“echocardiography”);
- 4) Development of heart catheterization techniques allowing the coronary arteries (the blood vessels nourishing the heart wall) to be visualized and photographed in conscious patients (“coronary arteriography”);
- 5) Use of these catheterization techniques to identify blocked arteries during heart attacks;
- 6) Development of drugs able to dissolve the blood clots causing these arteries to be blocked (“coronary thrombolysis”);
- 7) Use of modern analytical technique (“radio-immunoassay”) to detect when a blocked artery has been reopened by analyzing a small blood sample;
- 8) Development of inflatable balloons at the tips of small catheters which can be passed into a blocked artery and inflated to relieve the blockage (“percutaneous transluminal coronary angioplasty”); and
- 9) Use of open heart surgery to “bypass” blocked arteries which cannot be treated by other means (“coronary artery bypass graft surgery”).

Despite these many and impressive contributions, problems remain. The most vexing of these is the identification of patients who are likely to die in the very early phases of heart attacks before they can receive medical attention. Further contributions to these problems are awaited – and urgently needed – from modern science and technology.

Note: Dr. Klocke’s complete paper will be published in the 1989 **NAST Transactions**.