

**Institute for Alternative Futures**  
**Foresight Seminars on Health and Innovation**

**SUMMARY**

FORESIGHT SEMINAR ON THE FUTURE  
OF CORONARY HEART DISEASE:  
PREVENTION, TREATMENT AND CURE  
September 26, 1983

**ABSTRACT**

There are different visions of the future for coronary heart disease (CHD) which carry contrasting implications for research policy. One vision sees new understanding arising from a recognition of the factors that create health. The adaptation to stress, for example, is integral to prevention and treatment of CHD, but according to this view, the focus on disease ignores such environmental relationships. The role of diet, particularly highly processed food, may be another important factor. By shifting the emphasis from disease to health, it is hoped that there may not only be a 30% decrease in CHD over the next 20 years, but also that there will be a corresponding increase in health.

Another view of the future of CHD sees the past successes in surgical and therapeutic techniques as an argument for further development of new technologies. These include: new diagnostic equipment, such as sophisticated scanners which permit earlier recognition of heart disease; new pharmaceuticals which will be site—specific with fewer side-effects; and improved surgical techniques, using new technologies such as lasers. There will also be further development of mechanical support devices which may be implanted into the body to replace or augment the heart.

A third perspective suggests that resources should not be concentrated on treatment for end-stage disease; higher priority needs to be given to prevention. Research into CHD is achieving increased knowledge at the molecular level, pointing to genetic and environmental factors in the formation of the disease. This may help identify populations at greater risk for CHD as well as some of the steps they may take to modify their risks. Where prevention is not effective, a second priority should be to develop widely applicable therapies that are less costly than the expensive measures that need to be taken in the final stages of CHD. This will include dramatic new techniques for early diagnosis of disease as well as more effective pharmaceuticals.

These three views of the future of CHD are not incompatible, yet they are competing visions insofar as they relate to the allocation of research funds. The wellness programs associated with the health promotion view can save a great deal of money if they are as effective as proponents believe. Many technological interventions that have developed for CHD have proven effective, but the costs raise questions about whether we can afford the possible cures and treatments for CHD. The mixed strategy of giving priority to prevention while continuing to support efforts aimed at treating advanced CHD, pragmatically seeks to pursue opportunities raised in both of the above approaches. Critics

## **Institute for Alternative Futures**

### **Foresight Seminars on Health and Innovation**

argue, however, that the mixed strategy may be missing opportunities that exist in prevention.

The September 26 Foresight Seminar began with an alternative approach to CHD research described by Russell Jaffe, M.D., Ph.D. Then Robert B. Wallace, M.D., Professor and Chairman of the Department of Surgery of Georgetown University Medical Center discussed future developments in the diagnosis and treatment of CHD along with some of the social issues involved. The third speaker, Peter L. Frommer, M.D., Deputy Director of the National Heart, Lung, and Blood Institute, explained how basic research, prevention and the development of new therapies are part of the effort to control CHD in the future.

#### **HEALTH, HOLISM AND TECHNOLOGY**

"Health is more than the absence of disease," Dr. Jaffe said in outlining his perception of the challenges CHD poses. In the same sense that joy is not the absence of sorrow, health is not the antithesis of disease, Dr. Jaffe argued. Health is a process, an on—going, holistic way of life.

As an example, Dr. Jaffe said, "Our understanding of health has not yet begun to emerge out of the research into molecular disease mechanisms that goes on at NHLBI." He added, "If we look at some of our research agenda and see that the way in which we organize the allocation of funds is a reflection of our priorities or the understanding that we have of the mechanism, then we would say, at least with regard to heart disease, that the preponderance of our funds are spent on disease-oriented research, molecular mechanism-oriented research. And these are important dollars."

Yet this emphasis is to some degree misplaced. "Indeed," Dr. Jaffe said, research at the molecular level is just that; it is not the same as research at the societal level. And by altering variables, as is done with molecular studies, one necessarily removes some realism from the study.

Cause and effect, from a medical standpoint, is difficult to discern, according to Dr. Jaffe; this is true even in an area which has received as much scientific scrutiny as coronary heart disease. Rather, researchers, including Rene Dubos, have noted that diseases change in pattern, prevalence and incidence "often for reasons quite independent of those we ascribe to them." Often it is community-based and individual-based activities, such as relationships and their quality, which contribute to the development of disease.

"Heart disease is principally environmental, not genetic," Dr. Jaffe said. Furthermore, "phenotypes...of blood lipid patterns change within an individual and from one individual to another within a family." Due to research findings, it is not unreasonable to speculate that changes in one's environment, such as adaptation to stress, are integral to the prevention and treatment of heart disease. Finally, even as we begin to cope with the mechanisms of disease that we have known about for some time, new mechanisms have arisen.

## **Institute for Alternative Futures**

### **Foresight Seminars on Health and Innovation**

Dr. Frommer countered Dr. Jaffe's remarks, saying that "our first and foremost priority in all of our activities has to be prevention. The second is widely applicable forms of therapy for disease because we're not quite so optimistic to believe that prevention is going to be universally effective. And a third priority is therapies of a type which really are for end-stage disease, therapies which do not lend themselves to widespread application because of their expense and other features.

"Given these three hierarchies of priority, how do we move forward?" Dr. Frommer asked. "The answer is to mix opportunities, ideas and resources." This is best done by investigating both normal and disease processes, through both basic and clinical research.

Dr. Wallace agreed with Dr. Frommer's contention that the focus of research efforts should be in controlling disease, not spending money on experiments to test assertions about the true-nature of health. He outlined the development of a myriad of technological innovations which have allowed more effective treatment of CHD in all stages of severity. Most recently these have included sophisticated imaging techniques used "to assess not only the coronary vasculature, but the function, including the cellular function, of the myocardia."

The technological tools presently available to the surgeon and therapist include radioisotope scanning techniques, nuclear magnetic resonance procedures, the PET scanner, and the dynamic spacial reconstructor. Dr. Wallace lauded these instruments for their "potential for giving us a tremendous amount of information about not only the anatomy and structure, but also the function of the heart."

These techniques have the potential of allowing early, accurate diagnosis. However, Dr. Frommer added later that this may be of little importance in the case of CHD, for the advice given to those in good health is practically the same health message as that given to those in whom silent CHD is uncovered.

Furthermore, what are the real costs of CHD? Dr. Wallace said there are three ways of measuring cost--charges, real costs for services, and intrinsic costs. "The first two, economists worry about, but the third is not often talked about. The difference between the real cost, which can be billed, and the intrinsic cost of something may be quite different.

Dr. Wallace said some diagnostic tools have been over-used. The movement toward diagnostically-related groups (DRGs) may curb this. "I think they will have a favorable effect [on health care costs]," he said. "A concern that everyone has is what adverse effect that may have on health care. These measures have long been needed as a stimulus to the profession to react differently than we have in the past when there has been little incentive to control costs.

## **Institute for Alternative Futures**

### **Foresight Seminars on Health and Innovation**

"I think," Dr. Wallace added, "its going to make one very objective in assessing the appropriate application of the various diagnostic methods.. What has happened in many instances where new diagnostic tools have been introduced which ideally should replace other diagnostic tools, is that it's an add-on, not a replacement. ...I think the ORG is going to make us look very, very carefully at what is the proper approach, the most effective approach, to get the needed information."

Yet Dr. Jaffe insisted that we examine our environment, from the air we breathe and the habits we maintain to the content of the food we eat, when we attempt to sort out the puzzles CHD confronts us with. An example of this is the role of naturally-occurring toxins, including mutagens and carcinogens. Dr. Jaffe cited a recent study published in Science magazine (Sept.22, 1983) which touched on a related area. Researchers at the University of California showed that mutagens and carcinogens, as well as anti-mutagens and anti-carcinogens, commonly occur in foods. Although they did not make note of the level of processing of foods examined as part of the original study, Dr. Jaffe reported that the UC researchers are now doing just that.

#### **A LOOK AHEAD**

There was a little more agreement among the panelists on the direction that CHD research and treatment will take in the future. In the coming decades, Dr. Frommer said, basic research in CHD will probably expand in areas including: hereditary and acquired factors, bio-behavioral variables, disorders of control, the role of the central nervous system, metabolic control, thromboatherogenesis of the organism and the formation of lesions, and the concept of receptors for metabolic products not just for hormones.

Dr. Frommer added that therapy in the next decade will probably resemble today's therapies except that it will be more effective and more selective so that the subgroup of patients who can profit most from therapies will be the ones chosen to receive it -- and those with little to gain will not be burdened with needless therapy. Pharmaceuticals with fewer side effects and long- duration of action will also be developed. These conditions will be true for most medical fields, he said.

Improved patient education will have effects similar to those witnessed with efforts to reduce high blood pressure. Treatment for hypertension improved with increased education efforts, and the same will likely be true in the coming decades for a number of other areas affecting CHD.

#### **ALLOCATION OF RESOURCES**

Resource allocation is emerging as a particularly controversial subject in nearly every area of health care. Some have said that "who gets what, when and how" is politics; if this is so, Dr. Wallace offered to open the political debate on medical resource allocation to all of society. "When I talk about making decisions," Dr. Wallace said, "I'm not talking about

## **Institute for Alternative Futures Foresight Seminars on Health and Innovation**

the medical profession; I'm not talking about Congress or the appropriation committees. mean society is going to have to decide at some point how we're going to allocate our resources and what they are....The people, all of us, are going to, at some point, have to decide how we can spend what we have and where is it going to be most beneficial.

"In the coming five years,' Dr. Wallace said, "resources should be allocated, to a large extent, to the treatment of disease rather than to disease prevention 'because I don't think we're going to achieve, in a five year period, what we would like to in the area of prevention. If we're talking about a longer period of time, we ought to put some of our money, very definitely, in the preventive area." There are ways of beginning prevention measures without directly funding disease prevention programs, Dr. Wallace said. For instance, tobacco, which "is all bad, " is monetarily supported by taxpayers at every level from its planting on through to the medical research and health care that smokers receive. It is contradictory in the extreme to be urging health promotion yet supporting something as deliterious to health as tobacco products.

Dr. Frommer said these societal problems are inescapable. Do we really want to spend so much of our health care resources on end stage disease -- on extending life often without improving the quality of life? And most importantly do the recipients really want it that way? Do we want to spend one-third of our medicare dollars for people in the last year of their life? Years ago, pulling out all the stops was possible without bankrupting our social resources; we were not nearly as effective in extending life with chronic infirmity and many of our technologies were not nearly as expensive. However, the complexity of new technologies and their requirements for substantial amounts of scarce resources force society to take a new look at the direction of medicine. "We're going to have to address that [resource] question as a society by saying 'Hey, where are we going, how do we want to get there, and where are we going to allocate the resources.

Dr. Jaffe took a different tack to answer the problem of health care resources. 'Exactly what does 'prevention' mean?" he asked. "For me, prevention would mean investing in understanding of health and well-being." A California study involving various media did, over time, influence residents to improve the health quality of their lifestyles. "Understanding is a cost-efficient way of investing in people's cardiac health."

The sort of wellness programs Dr. Jaffe encourages are cost-effective as well, he said. One study which he cited showed that for every dollar spent on in-home interaction with the elderly--not in-home nursing care--\$10 were saved in health care costs over a two year timespan. Jaffe also called for the reintroduction of "the art of medicine" through a National Service Board that would combine the old-style, intimate patient-physician relationship with the technological sophistication available to doctors today.

Dr. Jaffe predicted a 30% reduction in CHD over the next 20 years. "The question, though, for me, relates to quality of life. If we replace one illness with another, we may on balance have not done ourselves a great service. So I think we have to look at both the

## **Institute for Alternative Futures Foresight Seminars on Health and Innovation**

changing pattern of heart disease and the overall subject of health and whether we can, in fact, over the next decade not only see an acceleration in the decline of heart disease but also an acceleration in the promotion of health and well-being."

Through the acceptance of lifestyle changes, the "intrinsic morbidity" level which some assert is genetically a part of humans can be all but eliminated, Dr. Jaffe said. He estimated that the average lifespan in industrialized nations might possibly extend to 100 or more years within the coming decades.

However, Dr. Frommer's perception of "prevention" was much different from Dr. Jaffe's. Dr. Frommer argued that prevention research implies an understanding of the disease process in order to achieve prevention. Such words as prevention are definitional, according to Frommer. Terms such as prevention, treatment and rehabilitation are not easy pigeonholes for classifying research. For example, one operation -- an aortic valve replacement -- can be "prevention" if a person has no symptoms even though he needs the operation. Another person may have symptoms which are not incapacitating, and for him the operation is "treatment." A third person may be disabled, even bedridden with his heart disease and in him the operation restores activity and is rehabilitation." In thinking about research, and that includes research on prevention, the trick is to take the ideas which hold promise for giving us fundamental knowledge and nurture them without anticipating the direct beneficial consequences.

### **QUESTION AND ANSWER PERIOD**

What is the role of aspirin as a preventative for heart disease? "Unclear," Dr. Frommer said. Aspirin in this context is a platelet-active drug. It inhibits the aggregation of platelets. It's important to remember that a recent Veterans Administration study which showed that aspirin is an effective preventative was a study of patients who were hospitalized with symptoms thought to represent heart attack but did not end up with a heart attack. This is not primary prevention. Other studies have shown mixed results.

What is NHLBI's vision of the study of the health of the heart, and how extensively is it willing to commit resources to such examinations? Dr. Frommer answered, "We have to study both normal and disordered hearts. We must also examine the environments and behaviors that promote and deter CHD. Research on health is not separable from research on disease. NIH "has spent large amounts of money...in understanding what constitutes normal behavior of an organism, of a tissue, and of a human."

However, Dr. Jaffe said health promotion is underfunded and underemphasized by NIH. "My understanding is that perhaps 1 1/2 percent of NIH resources are allocated to what we might agree in broad terms rare programs designed for disease prevention]," Dr. Jaffe said. "The Office of Health Information and Health Promotion at the Secretary level has a budget of \$1.2 million. That's in contrast to roughly \$600 million for the Heart Institute...There is currently no study section at NIH] that I know of that addresses the

## **Institute for Alternative Futures**

### **Foresight Seminars on Health and Innovation**

biobehavioral question as a principal focus of the health initiative/health promotion question as an initiative."

Dr. Frommer defended NIH's emphasis on research. He said, "After the grants have been submitted and reviewed and the favorably reviewed ones are budgeted, then we see how much money has been allocated by the peer review system. And then we say 'This is how much is being spent.' We do not start out by saying 'We are going to spend so much.' We do have a study section on behavioral medicine and we do spend a great deal more on primary prevention — primary prevention by most anyone's definition

What is the current state of research in Tissue Plasminogen Activators (tPAs)? "The interest in tPA," Dr. Frommer said, "has come about because of renewed evidence that heart attacks are generally caused by coronary thrombosis. Agents which can break up the thrombus and thus help recantilize the artery may solve a number of problems."

In response to a question about the effects of lowering the levels of blood cholesterol, Dr. Jaffe said food processing has a lot to do with the levels of dangerous cholesterol. And, in the end, blood levels of cholesterol and the body's ability to synthesize cholesterol are unique in each person. "There are oxidized cholesterol molecules and un-oxidized cholesterol molecules," he said. "That has led us to do a re-analysis of the data, and it is our finding that whole food cholesterol, un-processed cholesterol, is not damaging to blood vessels. Oxidized cholesterol, which may be present in trace amounts, is significantly angiotoxic." Thus molecules may undergo changes through food processing and, "if we look at cholesterol from a different vantage point, we say that maybe the blood cholesterol level is a response of the liver to adaptation. We know, for instance, the liver can synthesize enormous amounts of cholesterol, so that your dietary intake of cholesterol is not the most significant effector of what your blood fat level will be.

If we look at this from a wellness point of view, we say, 'Well, is this level of blood fat reflective of an adaptive, constructive response....Or is this level of blood fat reflective of a loss of feedback control.'" The study of such mechanisms may help us understand homeostatic equilibrium within the body. Cholesterol levels must be examined at an individual level, not against some non-existent norm; that is, "a more specific or sensitive index" may be gained by examining the quality of food which an individual eats, and thus a doctor has a better understanding of the nature of a patient's cholesterol problem, if in fact it is a problem at all.