

Research on the Major Killers of Americans

PHYSICIANS COMMITTEE FOR RESPONSIBLE MEDICINE

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Medical research is at a crossroads: The major killer diseases are not being cured by previous experimental methods. In order to overcome these diseases, doctors are prompted to learn new approaches and researchers are looking to new technologies.

Heart Disease

The greatest advance in the understanding of heart, or cardiovascular, disease (CVD) was the discovery that this disease can be virtually eliminated by controlling three factors: cholesterol, smoking, and blood pressure. This extraordinary advance came from sophisticated studies of human patients.

In Framingham, Mass., thousands of individuals spanning two generations were carefully studied over four decades in order to identify the risk factors responsible for heart disease. The Framingham Heart Study showed that maintaining a total cholesterol level below 150 mg/dL significantly decreases the likelihood of experiencing a heart attack.¹ A recent study based on a similar assessment method used the body mass index (BMI) to more accurately predict risk for CVD.² BMI incorporates cholesterol in its predictive ability, but does a better job of also incorporating the combined effect of smoking and blood pressure on a person's risk for CVD. Other studies have shown that intensive lifestyle changes can decrease the inflammatory biomarkers for atherosclerosis as well as improve cardiac risk factors. Some have shown that a low-fat vegetarian diet, combined with smoking cessation, stress reduction, and regular aerobic exercise, can prevent or reverse coronary artery disease.³

While coronary artery bypasses and heart transplants may be helpful for some patients, they are still subject to recurrent atherosclerosis and possible repeat surgery. High triglycerides, a type of fat, and low levels of protective cholesterol (HDL) are among the variables that increase this likelihood.⁴ Researchers have determined that a vegetarian diet may be nearly as effective

as some cholesterol-reducing medications.⁵ Vegetarian diets have also been shown to lower blood pressure.⁶ The research exists, therefore, in support of dietary and lifestyle methods of prevention and treatment. More research is needed, however, to determine effective means of helping people to change long-standing smoking and poor dietary habits. It will also be essential to develop economic and political studies on how to shift farm production away from tobacco and livestock, and toward grains, legumes, vegetables, and fruits.

Cancer

In 1971, President Nixon declared that there needed to be an aggressive "War on Cancer." Although the rate of new cancers seems to be stable, and even declining in some cases, cancer is still the number two killer in the United States. For men and women under the age of 85, cancer is now the leading cause of death. The chance of developing cancer over a person's lifetime is 46 percent for men and 38 percent for women.⁷

Unfortunately, no known cure for cancer exists. A large body of data now shows, however, that certain types of cancer can be prevented through lifestyle modifications. The National Cancer Institute estimates that as many as 50 percent to 75 percent of cancer deaths in the United States are caused by human behaviors such as smoking, physical inactivity, and poor dietary choices.⁸ Scientific evidence prompted the American Cancer Society (ACS) to report in 2011 that one-third of the expected cancer deaths for that year would be attributable to overweight or obesity, physical inactivity, and poor nutrition, and thus preventable.⁹ According to the 2011 ACS statistics, colorectal cancer is responsible for the third highest number of new cancer cases and deaths for both men and women. Thanks to increased screening for colorectal cancer, which identifies precancerous polyps for subsequent removal, these statistics actually represent trend decreases. Still, an ounce of prevention is worth a pound of cure. The World Cancer Research

Fund and the American Institute for Cancer Research published two expert reports on the ability of various vegetarian diets to decrease overall cancer incidence. Diet is particularly implicated in the prevention and causation of colorectal cancer, which, as stated above, accounts for a significant percentage of existing cancer cases and deaths. Convincing evidence exists that physical activity decreases risk for colorectal cancer, but that red meat, processed meat, alcohol, and excess body fat—particularly abdominal fat—increases risk.¹⁰ Conversely, the reports state that there is probable evidence that dietary fiber, garlic, and calcium decrease risk. A number of epidemiological studies support the probable protective benefit, especially for men, of fiber, folate, calcium, and vitamin D through increased fruits and vegetables, and decreased red and processed meats, though continued research is warranted.¹¹

Cellular Tests for Cancer-Causing Chemicals

Conventional animal tests to determine the cancer-causing ability of substances, or carcinogenicity, take around three years to design, conduct, and interpret. Consequently, only a tiny fraction of the thousands of industrial chemicals currently in use have been tested for carcinogenicity. Despite the costs of hundreds of millions of dollars and millions of skilled personnel hours, as well as millions of animal lives, investigations have revealed that animal carcinogenicity data lack human specificity (i.e., the ability to identify human non-carcinogens), which severely limits their applicability to the potential effects in humans.¹² Another review found that the standard animal test conducted for cancer hazard, the “rodent cancer bioassay,” had a 15 percent false negative rate and 80 percent false positive rate among pharmaceuticals the FDA considers of “enhanced concern for cancer hazard.”¹³

There are many nonanimal methods that can be used to detect carcinogenesis potential.^{14,15} The onus is now on regulatory authorities in the United States and other regions to accept these more human-relevant, faster, and less expensive methods to improve our ability to detect potential carcinogens. A recently proposed

tiered strategy of in vitro tests was shown to detect up to 90 percent of known carcinogens.¹⁶

Stroke

A stroke occurs when blood supply to part of the brain is interrupted or severely reduced. This can lead to paralysis, loss of sensory function, and often death. Clinical and epidemiologic studies have shown that the same factors that lead to heart disease—high blood pressure, elevated cholesterol levels, and smoking—can also cause stroke.¹⁷ Controlling these factors can prevent stroke, thereby strengthening the need for more aggressive measures to help people change dietary and smoking behavior.

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