

dontitis, and noninflammatory conditions such as aging (possibly because of oxidative stress⁸) and obesity. In this view, C-reactive protein itself could be the principal acute-phase contributor to vascular disease. Of the acute-phase changes mentioned previously, however, elevations in interleukin-6, triglycerides, secretory phospholipase A₂, ICAM-1, circulating leukocytes, and fibrinogen have also been associated with an increased risk of coronary events in epidemiologic studies of healthy adults, as have acute-phase responses such as elevations in the blood levels of serum amyloid A and decreases in high-density lipoprotein (HDL) cholesterol. C-reactive protein can enhance cholesterol uptake by human macrophages as well as their expression of tissue factor, and it may be found with complement in atherosclerotic lesions. Plausible roles in atherothrombosis can also be proposed for the prothrombotic changes⁹ noted above and for the decrease in, and remodeling of, circulating HDL that results from the acute-phase response. How much any acute-phase protein actually contributes to the formation of atheromas or coronary thrombosis in humans is uncertain, however.

The observation that the reductions in C-reactive protein levels and lipid levels induced by statins do not correlate with one another suggests that, in addition to their ability to reduce LDL, statins may also inhibit the inflammatory or noninflammatory processes that induce acute-phase responses.¹⁰ The biochemical mechanism of an antiinflammatory effect is uncertain; the depletion of cholesterol in the membranes of inflammatory cells or the reduced isoprenylation of signaling proteins in those membranes are the chief possibilities.¹⁰ Whereas various statins can reduce C-reactive protein levels,¹¹ their effect on acute-phase proteins such as fibrinogen and PAI-1 has been inconsistent,^{11,12} raising the possibility that they inhibit some components of the acute-phase response (perhaps the most dynamic) more than others.

The two viewpoints are obviously not mutually exclusive, and both mechanisms could operate in the same person. Recent studies suggest that statin therapy may also prevent diabetes mellitus,¹³ osteoporosis,¹⁴ and Alzheimer's disease.¹⁵ In each of these conditions, as in coronary disease, the beneficial effect of the drugs might be attributed to their LDL-lowering activities, their antiinflammatory activities, or both. If statins inhibit the acute-phase response by diminishing the intravascular deposition of cholesterol and phospholipids, more potent statin treatment will probably not interfere with acute-phase responses to infection, injury, and other types of stress. If they broadly inhibit the acute-phase response, on the other hand, the ultimate preventive effect of these remarkable drugs could be limited, at least in part, by their ability to attenuate the beneficial functions of that response. The data presented by Ridker and colleagues should stimulate further exploration of the effects of

statins. The authors' results also call for prospective, randomized trials to determine whether C-reactive protein testing can be used to identify persons whose coronary risk can be reduced by statin therapy and, if so, what the magnitude of this reduction is likely to be in persons with defined, stable levels of C-reactive protein and lipids.

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ECOLOGY IN EVOLUTION

“CURRENT discussions about medical care appear largely concerned with two questions: Is the burgeoning harvest of new knowledge fostered by immense public investment in medical research being delivered effectively to the consumers? Is the available quantity, quality and distribution of contemporary medical care optimum in the opinion of the con-

sumers?” These sentences could have been written anytime in recent years, but they were the opening of an article entitled “The Ecology of Medical Care” that appeared in the *Journal* in 1961.¹ Its quantitative description of the way in which people in the United States and Britain seek and receive health care has often been quoted in the decades since. This article did much more than provide data; it offered a new context for evaluating the effectiveness of health care systems. White et al. argued that the performance of a health care system cannot be measured merely by calculating morbidity and mortality rates. The focus of their analysis was therefore not diseases, but patients’ experiences with the health care system during episodes of illness.

Using data from the United States and Britain, White et al. estimated that, during a typical month, about 68 percent of adults had symptoms of illness or injury and 23 percent of adults consulted a physician. Only about 1 percent of people were hospitalized in a typical month, and 1 in 1000 was hospitalized in an academic medical center.

Some of the information used to make these estimates was dated even then, with some data having been collected between 1928 and 1931. Nevertheless, as Green et al.² report in this issue of the *Journal*, little appears to have changed in the 40 years since the report by White et al., despite changes in the U.S. health care system that feel dramatic. In contrast to the case in 1961, the government now provides insurance coverage for the elderly and the poor, managed care has transformed medical practice, and insurance coverage for medications is much more common (although the medications themselves may be much more expensive). Medical research has produced a range of interventions that can keep people healthy or prevent complications of chronic diseases. Even the information and analytic tools available to Green et al. were superior to those used in the earlier study. Nevertheless, the main results were virtually the same: each month, of 1000 people in the United States, an average of 800 have symptoms, 217 visit a physician, 8 are hospitalized, and less than 1 is admitted to an academic medical center.

Closer examination of the new data, however, reveals evidence of a health care system that is undergoing major changes to meet the needs of a new generation of patients. The public treasures the doctor–patient relationship, but it is disappointed by the chaos caused by the systems that surround physicians. A telling finding in the report by Green et al. is that, in a typical month, about 33 percent of people consider seeking medical care, but only 22 percent visit a physician in the office. What happens to the one third of people who consider seeing their doctors but do not? Many of them receive care from providers of complementary or alternative medicine, and some go to emergency departments. What about the rest?

We lack comparable data from earlier eras. Perhaps the proportion of people who considered seeking health care but did not visit a doctor has been even larger in the past. Furthermore, people with symptoms who do not see their doctors are almost surely less severely ill than those who do. Some cynics might argue that barriers to care in the case of people with mild symptoms are a good thing, since physician visits for all these people would further increase the costs of health care.

However, patients today are increasingly unwilling to live with the perception that their needs are going unmet. In the United States, the baby-boom generation has transformed every institution with which it has come into contact. Education is only one example. As this generation ages and begins to have chronic diseases, we can expect health care to be next. The baby boomers have made consumerism a way of life; hints of their impact can be found in data demonstrating that the length of office visits is actually increasing, despite a widespread belief to the contrary.³

One of the most powerful demands is for information. Patients want to know the meaning of their test results, the side effects of their medications, the implications of a report that was in the news, and the worst possible disease that could be the cause of a symptom that began that day. Physicians often consider responding to patients’ questions in any format outside of an office visit an annoyance — and one for which they are virtually never compensated. Many physicians tell patients, “I’ll contact you if any of your results are abnormal.” In the silence that follows, some patients wonder whether their test results actually were normal or were merely overlooked. Few offices devise systems to answer patients’ questions beyond having the doctor return telephone calls in spare moments. The provision of information to patients is managed by limiting access to busy doctors.

When physicians’ offices do not meet patients’ needs for information, patients turn to other resources, including the Internet. The information they receive varies in quality and is often difficult to interpret. Today, however, the provision of information to patients is increasingly recognized as a basic part of health care. To encourage physicians to meet this need, some insurers are evaluating an approach in which physicians are paid for e-mail communications with their patients.⁴

The new generation of patients also wants access. They do not want to wait two months for an appointment; in fact, they do not want to wait at all. The computer age has changed expectations of service industries: people expect to have their needs met 24 hours per day, seven days per week. Patients who have questions they would like answered and requests for prescription renewals, referrals, and appointments do not see why these issues cannot be raised on a weekend. Sometimes, patients would like to talk to a hu-

man being, not a computer masquerading as a receptionist, and they do not want to wait 30 minutes for a harried nurse, nurse practitioner, or doctor to return their call.

To improve access to care, office practice is being redesigned.⁵ New scheduling strategies allow most patients to be seen the day they make an appointment. Physicians' time is protected through the use of other approaches (e.g., group visits and set telephone call-in times) to meet patients' needs for information and education.

How quickly the health care system will evolve to meet these needs is uncertain. Nevertheless, the next examination of the ecology of medical care will almost surely include a range of new measures. Perhaps it will report the rates of e-mail communications between physicians and their patients, the levels of enrollment in disease-management programs, and the rates of use of other forms of care supplied by a range

of nonphysician providers. The aging of the baby boomers and the emergence of the Internet make up a powerful combination that should accelerate the rate of change in the American health care system.

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