Facts and ideas from anywhere

William C. Roberts, MD

INFLUENZA VIRUS

In 1918, a new influenza virus, whose natural home was in birds, infected humans. Within months, it adapted to its new host, starting with US soldiers in World War I military camps and spreading rapidly from person to person. This influenza virus killed more people than any other plague in history. In 24 weeks it killed more people than AIDS has killed in 24 years. The 1918 epidemic killed at

least 50 million people and perhaps as many as 100 million. The world's population then was only 28% of today's; a comparable death toll today would be 175 million to 325 million.

Today in Asia, an influenza virus is decimating flocks of chickens (1), and so far it has killed 22 people. All of the human victims caught the virus directly from chickens. So far, there have been no proven person-to-person transmissions. If the Asian virus adapts to humans, if it becomes capable of spreading from person to person, a major pandemic easily could follow. This would be a global disaster of immense proportions. If a new pandemic struck in the USA, the Centers for Disease Control and Prevention has estimated that the death toll in the USA alone would range from 90,000 to 300,000. That study in 1999, however, made 2 assumptions: that a new virus had only average virulence and that a vaccine was available. The 1918 virus had far more than average virulence. So does the virus affecting Asian birds today, and no vaccine now is available for the new virus.

There are 2 ways the virus can adapt to people. The first is for it to infect someone and mutate in a way that allows it to thrive in a new host. Influenza is part of a family of viruses that mutate so rapidly that virologists do not consider them a single virus; they call them a "quasi-species" or "mutant swarm." These viruses mutate at a rate 1 million times faster than more common viruses. If the virus infects enough people, it likely will produce a mutant strain capable of passing not from birds to people but from person to person. Evidence has recently suggested that the 1918 virus may have adapted to humans by such a mutation.

The second way the virus can adapt to humans is by infecting a person who also is infected with an existing human influenza virus. Two different viruses have the highly unusual ability to "reassort" their genes when they infect the same cell. This process is similar to shuffling 2 decks of cards together and then counting out the first 52 cards to form a new deck. The result would be a new hybrid virus with genes from both old ones. The hybrid virus could carry the lethality of the new bird virus and

also be able to pass from person to person. Reassortment also can occur in swine because they are susceptible to human and bird influenza viruses.

The World Health Organization constantly looks for new animal influenza viruses that infect humans. In spring 2003, a new virus in Europe—different from the one now in Asia—infected 84 people. Although only one person died, some 30 million animals, most of them chickens but some pigs, were slaughtered to prevent the virus from adapting to humans. In early February 2004, an outbreak in Delaware of a similar avian flu strain resulted in 12,000 chickens being destroyed in a single day, but this strain is not believed to be a threat to humans.

The European virus was relatively mild. The virus spreading through chickens in Asia is not. The longer it persists and the more people who are exposed to it, the more opportunity this lethal influenza virus has to adapt to humans. If it does adapt to humans, it rapidly could spread and kill many people.

To prevent this, the World Health Organization is asking governments for money and other resources so that it can pay farmers a fair value to slaughter their chickens; any incentives to evade control measures must be eliminated. In Vietnam, however, farmers have been paid only 10¢ on the dollar for culled birds, so farmers there have tried to sell their chickens. Thailand has not been truthful to its citizens about the existence of the chicken flu. Indonesia hid the existence of the virus and first said it would let farmers decide whether to cull flocks; now, it has ordered the slaughter of chickens. China, likewise, has not proved reliable on this issue.

The bird flu in Asia needs to have the full attention of every government in the world. The risks are too great to do otherwise.

ROSUVASTATIN AND EZETIMIBE*

*A slightly different version of this editorial appeared in the March 15, 2004, issue of *The American Journal of Cardiology*.

During the last 16 years, 7 statin drugs have been introduced in the USA for treatment of dyslipidemia. Of the 7, one (cerivastatin, Baycol) was withdrawn 4 years after its introduction because of a large number of cases of fatal and nonfatal rhabdomyolysis. Of the 4 statins (lovastatin, pravastatin, simvastatin, fluvastatin) introduced in the USA before 1997, all have proven to be safe and efficacious. Atorvastatin, the world's best-selling drug, was introduced in 1997, the same year that cerivastatin appeared in the US market, and it too has proved to be very efficacious and safe (2) and to have results of long-term outcome studies similar to those observed with lovastatin, pravastatin, and simvastatin (3, 4). Since 1997, only one new statin has been introduced in

Table. Comparative efficacy of the 6 currently available statin drugs

Comparable doses of statin drug (mg)						Decrease in serum cholesterol	
Rosuvastatin (Crestor)	Atorvastatin (Lipitor)	Simvastatin (Zocor)	Lovastatin (Mevacor)	Pravastatin (Pravachol)	Fluvastatin (Lescol)	Total	Low-density lipoprotein
—	5	10	20	20	40	22%	27%
—	10	20	40	40	80	27%	34%
5	20	40	80	80		32%	41%
10	40	80				37%	48%
20	80					42%	55%
40						47%	63%

the USA, and that was rosuvastatin (Crestor) in 2003. This piece summarizes some features of this newest statin and also discusses briefly some characteristics of ezetimibe (Zetia), the other drug for dyslipidemia also introduced in the USA in 2003.

Rosuvastatin calcium, compared with the other 5 presently available statin drugs, possesses the following features (5): 1) it is the most efficacious statin for lowering serum total cholesterol; 2) it is the most efficacious statin for lowering serum low-density lipoprotein (LDL) cholesterol; 3) it is the most efficacious statin for lowering serum non-high-density lipoprotein (HDL) cholesterol; 4) it is the most efficacious statin, along with atorvastatin, for lowering serum triglycerides; 5) it has safety features in its 5- to 40-mg dose range similar to those of the other 5 presently available statins; and 6) it has few interactions with other drugs, and the interactions it does have are similar to those found with most of the other presently available statins.

The efficacy of the 5- to 40-mg doses of rosuvastatin compared with that of the other 5 statins is summarized in the *Table*. Rosuvastatin at the 5-mg dose lowers LDL cholesterol levels an average of about 41%; at 10 mg, 48%; at 20 mg, 55%; and at 40 mg, 63% (5). Rosuvastatin raises the HDL cholesterol level more than any of the other statins, and that increase is dose related. Simvastatin also increases the HDL cholesterol as the dose of simvastatin increases (6). The increase with simvastatin is largest in patients with low baseline HDL cholesterol levels. Atorvastatin, in contrast, has decreasing effects on HDL cholesterol as the dose of atorvastatin increases (6).

Now to the potential downsides of rosuvastatin. First, there are no long-term outcome studies with this new statin. Significant long-term studies on atorvastatin, however, were not available until 6 years after its introduction (4), but, nevertheless, this excellent agent skyrocketed to the number one position in sales within months after its initial launch. In contrast to the situation with the other 6 statins, however, long-term studies were under way with rosuvastatin before it was approved by the Food and Drug Administration (FDA), and thus the results of those studies will be available in another 3 or so years. Second, the long-term safety of rosuvastatin has not yet been determined. Rosuvastatin, however, had been used in >10,000 subjects before its approval in the USA, a number far in excess of the patients studied in other statin trials before the statin was approved. Because the FDA had been burned by the particularly toxic effects of cerivastatin, which subsequently was withdrawn from the marketplace, rosuvastatin

received a particularly careful scrutiny before the FDA gave its approval.

One side effect noted before rosuvastatin was approved was proteinuria/microscopic hematuria in a small percentage (<1%) of patients taking this drug. This complication, however, was noted to occur primarily in the patients receiving the 80-mg dose and, as a consequence, that dose of rosuvastatin was not approved by the FDA. At doses of 5 to

40 mg, the frequency of proteinuria in patients on rosuvastatin appears to be similar to that of the other statins, and the possible appearance of proteinuria also is mentioned in the package inserts of some of the other statins. Studies have shown in certain nonhuman animals (opossum) that the proteinuria is the result of lack of adequate reabsorption of both high- and low-molecular-weight proteins in the proximal renal tubules. The proteinuria is not due to excessive filtration at the glomerular level. Furthermore, the proteinuria/microscopic hematuria is transient and does not lead to renal dysfunction, i.e., elevation of the serum creatinine level. There is some evidence that rosuvastatin is nephroprotective, as demonstrated by the fall in the serum creatinine level in many patients after institution of rosuvastatin therapy. This finding also has been observed with atorvastatin, simvastatin, and pravastatin. Additionally, patients with proteinuria at baseline have been observed to have less proteinuria after initiation of rosuvastatin therapy. The appearance of proteinuria with all statins at most doses (compared with no proteinuria at baseline) is <1% and usually no more than 0.6%, the latter percentage being that seen also in the placebo groups.

It is unlikely that rosuvastatin possesses the particularly toxic characteristics possessed by cerivastatin. First, rosuvastatin is relatively hydrophilic, just as is pravastatin, a characteristic possibly favoring safety. All the other statins are relatively lipophilic, and cerivastatin was the most lipophilic of all statins. The amount of statin available in the bloodstream (bioavailability) was by far the greatest with cerivastatin, namely 60%, whereas the bioavailability of rosuvastatin is 20% and all the other proven safe statins are also 20% to <5% (simvastatin). The frequency of hepatic serum transaminase elevations and the frequency of myopathy/rhabdomyolysis in patients on rosuvastatin (5- to 40-mg doses) have been low and comparable to those of the other 5 presently available statin drugs (7, 8).

Ezetimibe (Zetia), a cholesterol absorption blocker acting in the small intestine, also was introduced in 2003. It is available only in the 10-mg dose and as monotherapy lowers serum total cholesterol about 13%, LDL cholesterol about 18%, and triglycerides about 8%, with little effect on HDL cholesterol (9–14). When combined with any statin drug, the effect of ezetimibe on these lipoproteins is amplified such that the LDL cholesterol reduction jumps to 25%, the triglycerides decrease to 14%, and the HDL cholesterol increases to an average of 3%. Since 10 mg of atorvastatin or 20 mg of simvastatin lowers LDL cholesterol

an average of 34%, the combination of either of these statins at these doses with 10 mg of ezetimibe lowers LDL cholesterol an average of 58%, with an HDL cholesterol increase being an average of 9%. (The lowering of the serum triglyceride level is baseline dependent such that levels <100 mg/dL at baseline usually are unaffected whereas levels >200 mg/dL at baseline might be lowered by the combination by as much as 30% or so.) Since only about 20% of the ezetimibe in the small intestine is absorbed into the systemic circulation, specifically the enterohepatic circulation, the drug has no major side effects. Additionally, the side effects of the statin drugs at the lower doses are essentially the same as placebo. Thus, the combination of ezetimibe plus statin (at a relatively low dose) provides serum LDL cholesterol reductions of >50%, reductions available only with atorvastatin 80 mg (55%↓) and rosuvastatin 20 mg (55%↓) and 40 mg (63%↓). The mechanisms of action of ezetimibe and the statins are entirely different, a factor favoring the combination rather than high-dose statin. And, most adults in the USA would benefit greatly from a 50%+ reduction in serum LDL cholesterol!

Because the lower the serum LDL cholesterol levels, the lower the occurrence of atherosclerotic events, I predict, in contrast to *The Lancet* editors (unsigned editorial) (15), that both rosuvastatin and ezetimibe will prove to be highly effective agents and, in the end, that combination lipid-lowering therapy—just like combination high blood pressure therapy—will win out over monotherapy for patients with dyslipidemia. With any new drug, of course, it is wise to be cautious, particularly in view of the superb efficacy and safety records of the presently available lipid-lowering drugs. Therefore, at this time I would tend to limit, except in very unusual circumstances, the use of rosuvastatin to the 5-, 10-, and 20-mg doses and avoid the 40-mg dose. I see no downside from the 10-mg ezetimibe tablet.

ABDOMINAL AORTIC ANEURYSM

According to a piece in *Forbes*, about 2 million American adults have an abdominal aortic aneurysm (AAA), 90% are undetected, 15,000 patients die each year from ruptured AAA, and 50,000 patients undergo resection of an AAA in the USA each year (16). How to prevent these bulges? As a start, keep the serum total cholesterol <150 mg/dL and the peak systolic blood pressure <130 mm Hg. It seems to me that the evidence points toward AAAs being a combination of both atherosclerosis and systemic hypertension and, of course, both of these common maladies can be prevented. Years ago I weighed the hearts of 27 men with fatal AAA, and 20 (74%) had hearts of increased weight (>400 g) (17).

MORE CALORIES BUT DIFFERENT ONES

The Centers for Disease Control and Prevention in February 2004 examined 30 years of Americans' eating habits (18, 19). From 1971 to 2000, women increased their caloric intake by 22% and men, by 7%. In 1971 women averaged 1542 calories each day compared with today's 1877, while men went from 2450 to 2618 a day. These numbers dwarf the government's recommendations of 1600 calories a day for women and 2200 for men. Most of these surges in calorie intake occurred in 2 periods: from 1976 to 1980 and from 1988 to 1994. It was during those periods that national restaurant chains expanded serving sizes to 2 to 5 times larger

than in previous years. Candy bars became king-sized and sodas, supersized. The types of calories consumed also have changed. In women, the percentage of calories from carbohydrates rose from 45% to 52%, those from total fats decreased from 36% to 33%, and those from proteins decreased from 16% to 15%; in men, the percentage of calories from carbohydrates increased from 43% to 49%, total fats decreased from 38% to 33%, and proteins decreased from 17% to about 15%. These nutrition data were collected in personal interviews. The subjects were asked to recall everything they had eaten in the previous 24-hour period. Actual consumption levels, therefore, are probably higher, since most of us underreport what we eat.

MAKING ANIMAL FEED AND PRODUCING SANE COWS

Although probably many of us believe that nursing calves and cows get their food from munching on grass or hay, that bucolic scene changed years ago. For years, calves have been fed cow's blood instead of milk, and cattle feed has been allowed to contain composted wastes from chicken coops, including feathers, spilled feed, and feces (20). The FDA earlier this year finally barred these practices, saying that they could spread mad cow disease, which appeared in the USA for the first time in December 2003. But, the FDA did not prohibit other practices that involve using animal remains to make cattle feed. Although the USA banned the use of cow parts in cattle feed in the 1990s, it still permits rendered matter from cows to be fed to pigs and chickens and rendered pigs and chickens to be fed back to cows.

A recent expert panel advising the government urged a ban on using any animal remains to make feed supplements for cattle in the USA. The European Union has such a rule, but the USA does not, and the cattle industry has accused the advisory group of exaggerating the risk in the USA. Europe barred animal parts from cattle feed because scientists suspect that tissue from infected animals, particularly the brain or spinal cord from sick cows, can transmit the disease. Contaminated feed is widely believed to have started the mad cow epidemic that infected >180,000 cows in Britain in the 1980s and has led to the death of >140 people.

Any decision by the USA to take the panel's advice to bar all animal protein from cattle feed could have a large effect on another part of the livestock industry: rendering. Protein supplements derived from rendered livestock are added to feed to help animals gain weight and produce more milk. Decisions about what kinds of rendered animal parts can go into the cattle feed are made by the FDA. If it were barred from animal feed, the rendered material would still have to be disposed of, and we would have to build more landfills and other means of disposal, which are probably not as safe or environmentally acceptable as rendering. It might be best just to quit eating cows and then this problem would vanish.

KOSHER MEAT VS NONKOSHER MEAT

Kosher law requires the following: 1) that animals be killed by having their throats slit; 2) that the animals are capable of standing and walking before the killing, and 3) that the blood be removed from the bovine muscle (21). Do these 3 requirements indicate that kosher beef is safer and purer than nonkosher beef? Maybe slightly. That kosher rules do not permit the use of

“downer” cows, those too sick or injured to walk, is a positive, but now the US Department of Agriculture prohibits use of downer meat as nonkosher beef. That kosher cows are not stunned before their throats are slit is an item favoring kosher over nonkosher beef. Cows used for nonkosher beef are usually stunned with an air injection to the head, a process that can scatter brain tissue into other parts of the carcass. Because the proteins thought to cause mad cow disease are found in brain and nerve, the US Department of Agriculture also stopped the stunning maneuver for nonkosher beef as well. Cattle now are still typically knocked unconscious with a bolt to the skull, which may not pose as great a risk as the air-injection stunning. It is likely that the postslaughter inspection process to weed out animals with abnormalities is no stricter for bovine muscle used as kosher vs nonkosher. Kosher products have usually come from younger cows, those 18 to 24 months old, and this is an advantage over nonkosher beef because mad cow disease has a long incubation period and occurs mainly in older animals. Blood is removed from meat primarily by salting and washing. There are hints that this process reduces the presence of *E. coli* and salmonella in kosher beef, but the increased salt content of the kosher beef vs the nonkosher is a disadvantage of the former. Thus, in summary, the kosher label does not guarantee that the beef is safer and purer than nonkosher beef.

WORLD GROWS FATTER

Of the 6.2 billion world population, the World Health Organization estimates that 1.3 billion are overweight or obese (22). In the United Kingdom, 68% of men and 56% of women are overweight; in the USA, 67% of men and 62% of women; in Australia, 64% of men and 47% of women; in France, 61% of men and 47% of women; in Brazil, 57% of men and 47% of women; and in Japan, 26% of men and 23% of women.

DRIVING TIME AND BODY WEIGHT

Men's Fitness recently named Detroit the fattest city in the USA. Its 6'4", 300-pound mayor, Kwame Kilpatrick, was not thrilled at the city being number one. When Kilpatrick heard the news, he responded, “We love our cars.” It turns out that the car is a major ingredient on an enemy's list right beside Big Macs (23). One reason Motown moved from third to first place in the heavyweight division was an increase in commuting time. The waistline expands with the distance one lives from neighbors or from work or from the market. The further out one lives, the less one walks, the more one drives, and the more one weighs. The Robert Wood Johnson Foundation recently described sprawl as a public health menace. Urbanites on average are 6 pounds thinner than their suburban cousins. The number of miles an American drives has doubled since 1983, and the number of overweight children aged 6 to 11 has doubled since 1973. Kids today spend about an hour a day in cars, not counting the school bus. Many families, of course, move to the exurbs for a better lifestyle for the kids, where parents turn into chauffeurs and kids get strapped into car seats for the long ride. Although Americans may have a love affair with their cars, we also, of course, have an obsession with weight loss. At any given moment, 45% of American women and 30% of American men are trying to lose weight. Although we have to walk 35 miles to lose 1 pound, a 5-mile walk every day prevents a 1-pound increase every week.

RUNNING OUT OF GAS

Physicist David Goldstein, vice provost of the California Institute of Technology, argues that the age of oil is ending in *The End of the Age of Oil* (24, 25). The supply will soon begin to decline, precipitating a global crisis. Oil production peaked in the early 1970s, and American oil production has been declining ever since. There was no crisis because the US tapped the world's reserves and the supply increased along with demand. Goldstein and many others predict that the world oil supplies will peak during this decade! Once that happens, the world's supply of oil will begin to decline gradually, even though large quantities of oil will remain in the ground. The world demand for oil will continue to increase. The gap between supply and demand will grow. When the supply falls and the demand rises, the price will go up. With the high price, companies will go after more costly oil. In the best-case scenario, he writes, “We can squeak through a bumpy transition to a natural-gas economy while nuclear power plants are built to get us past the oil crisis. In the worst-case scenario, runaway inflation and worldwide depression will leave many billions of people with no alternative but to burn coal in vast quantities for warmth, cooking, and primitive industry.”

Goldstein points out that hydrogen is not a source of energy. It is a fuel produced by using energy. We can use coal to produce it, or solar power, or something else, but it is only a way of converting energy into a form that can be used in vehicles. It does not do anything to ease the transition away from oil.

Even nuclear power is only a short-term solution. Supplies of uranium, too, will also peak, and the current known reserves will supply the earth's energy needs for only 25 years at best. There are other nuclear fuels, and solar and wind power might help at the fringes. He argues, “The best, most conservative bet for ameliorating the coming fuel crisis is the gradual improvement of existing technologies. We can improve the efficiency of lights, tap solar power with cheap photoelectric cells and turn to nuclear power. The problem is that we have not made a national or global commitment to do so.” Our grandkids will face a very different world than the present one.

TAX THE FAT

Ireland, noted for fried breakfasts of epic proportions, is chewing over the possibility of a special tax on fatty foods to tackle rising obesity levels. That's a good idea that we in the USA should consider (26).

ROBERT ATKINS, MD

A February 10, 2004, piece in *The Wall Street Journal* discussed the weight and heart history of Dr. Atkins, the diet guru (27). He died in April 2003, and an autopsy was not performed. A report of the external examination of Dr. Atkins from the chief medical examiner's office in New York City described Dr. Atkins as having weighed 258 pounds and measuring 72 inches in height. That would give him a body mass index of 35 kg/m², a number clearly in the obesity area. Dr. Atkins' immediate cause of death was a head injury from a fall on ice while walking to work. An interview of his widow, reported in *USA Today* the day after *The Wall Street Journal* piece appeared, indicated that Dr. Atkins had evidence of coronary heart disease, demonstrated apparently by a coronary angiogram, but his heart disease was the result

of “cardiomyopathy.” It is likely that his cardiomyopathy was ischemic cardiomyopathy, however, and not idiopathic dilated cardiomyopathy.

INCREASING THE CIGARETTE TAX

Some state senators in Texas have recommended increasing the cigarette tax, a user fee paid only by those who smoke (28). The present cigarette tax in Texas is 41¢ per pack. Raising that tax by \$1.00 per pack would accomplish several goals: 1) it would decrease the number of adult cigarette smokers because of the higher price; 2) it would keep an estimated nearly 300,000 kids from becoming smokers because they could not afford the packs; 3) it would decrease the annual Medicaid costs linked to smoking-related illnesses; and 4) it would make nonsmokers happy because overall cigarette smoking in the state would decrease.

HEALTH SAVINGS ACCOUNTS

The new prescription drug benefit law signed by the president in December 2003 allows nonelderly Americans the right to have a tax-free health savings account (29). Its creation will help correct a major distortion in the tax law, which has shaped our entire health care system in a perverse way. Under current law, every dollar an employer pays in employee health insurance premiums avoids income and payroll taxes. This generous tax subsidy means that government is effectively paying for nearly 50% of the cost of the health insurance. Suppose the employer tries to put that same dollar in a savings account from which an employee pays medical expenses directly. In this case, government will fully tax the dollar, taking almost half of it before it lands in the account. Thus, our present tax law lavishly subsidizes third-party insurance and severely penalizes individual self-insurance. It encourages us to use third-party bureaucracies to pay for minor discretionary expenses, even though it would make more sense for patients to manage those expenses on their own. The new legislation will change all of that. It will give deposits to the health savings accounts the same tax advantages now granted only to health insurance premiums. It will allow individual self-insurance and third-party insurance to compete on a level playing field by allowing individuals to control some of their own health care dollars without a tax penalty. Health savings accounts will be the most flexible, consumer-friendly accounts yet devised. They will allow individuals and their employers to make deposits each year equal to their health insurance deductible. The funds will grow tax-free, and people may use them to pay expenses not covered by insurance, insurance premiums between jobs, and health expenses during the years of retirement. The health savings account will be a vast improvement over what we have today.

UNIVERSAL HEALTH CARE

The Institute of Medicine, a division of the National Academy of Sciences, has strongly urged the adoption within 6 years of a universal health insurance plan (30). Texans might support a move toward universal health insurance because Texas leads the nation in the percentage of its population without insurance—28%. Minnesota has the best record: only 9% of its population lacks health insurance. The institute group did not recommend any particular plan or estimate the cost of a universal health insurance system. Its report emphasized several guiding

principles: that health care coverage should be universal, continuous, affordable, sustainable, and enhance health and well-being by promoting access to high-quality care that is effective, safe, timely, patient-centered, and equitable.

THE NONFIGURED COSTS OF ILLNESSES

Peter Huber, writing in *Forbes*, declared that the cost of health care in the USA has been declining steadily for the last 50 years and will decline even faster in the next 50 (31). By far the largest economic cost of illness is lowered labor productivity. Sick people can't work, and when adults die in their prime, they take their intelligence, skills, and initiatives with them. Until recently, the cost of illnesses among children and the elderly also was shouldered mainly by the healthy adults who devoted countless hours to their care. Such costs are not reflected in revenues to physicians or hospitals or in federal insurance programs. They are felt in lost corporate profits, lower wages, and, for many women, tireless but entirely off-budget toil in the home.

Vaccines, of course, have all but eradicated many of the most common childhood diseases, and antibiotics have substantially curbed infectious diseases among adults. However much it cost to develop the whooping cough vaccine or to distribute it free to families who could not afford it, the cost must surely have been dwarfed by the economic gains that came from freeing up mothers to engage in other pursuits. Tuberculosis was an incredibly expensive disease in the past, and polio meant braces and iron lungs, and the costs of the latter have all but disappeared!

Huber pointed out that while the costs of incapacity, home care, and the sanitarium have declined, spending on hospitals and physicians has risen sharply. Families began outsourcing their health care, particularly for the elderly. This pushed the cost out where it could be covered by insurance programs and government programs. Most of these dollars, however, are still spent buying time—that of physicians, nurses, geriatric attendants, and others who have replaced the full-time caregiving mom. Hospital care currently consumes 30% of our on-budget health spending; physician and clinical services, another 22%. These costs are mainly the cost of paying one person to look after another. Prescription drugs, which currently account for only 11% of our on-budget health spending, can change the economics of health care fundamentally. Although extremely expensive to develop, once developed they usually cost little to manufacture. In the end drugs get good enough to beat diseases and thus displace physicians and hospitals altogether. We are at the threshold of an entirely new era in pharmacology. We will surely spend more on drugs in the coming years than anyone has allowed for in existing budgets, but eventually the drugs will be inexpensive, whatever their price.

MATERIAL PROGRESS AND HAPPINESS

Gregg Easterbrook has written *The Progress Paradox*. Some of his observations: American life expectancy in 1900 was 47 years and in 2000, 77 years (32). Our great-great-grandparents all knew someone who died of some disease we never fear. As recently as 1952, polio killed 3300 Americans. Our largest public health problems arise from unlimited supplies of affordable food. The typical American has twice the purchasing power his mother or father had in 1960. A third of America's families own at least 3

cars. In 2001, Americans spent \$25 billion—more than North Korea's gross domestic product—on recreational watercraft. Households today average fewer people, so real dollar incomes in middle-class households are about 50% higher today than 25 years ago. Since 1970, the number of cars has increased 68%, and the number of miles driven has increased even more, yet smog has declined by a third and traffic fatalities have declined from just under 53,000 to just under 43,000 last year. In 2003, we spent much wealth on things unavailable in 1953—a cleaner environment, reduced mortality through new medical marvels (\$5.2 billion a year just for artificial knees, which didn't exist a generation ago), and the ability to fly anywhere or talk to anyone anywhere. The incidence of heart disease, stroke, and cancer, adjusted for population growth, is declining. The rate of child poverty is down in a decade. The USA soon will be the first society in which a majority of adults are college graduates.

Nevertheless, there appears to be an imbalance between our abundance of material things and the scarcity of meaning in some of our lives. Easterbrook asked the question: If the evidence for revolution in living standards is so overwhelming, why aren't people happier? This is the paradox of recent progress. The number of people in the USA who describe themselves as "very happy" has decreased slightly since 1950 (to 6% from 7.5%), and the percentage of those who consider themselves "happy" has remained at 60%. Meanwhile, the incidence of depression has increased sharply. Easterbrook suggests several reasons why people are not getting happier despite material progress: the media's focus on disaster, the stress of modern living, and what he calls "collapse anxiety," the fear that hard-won gains will come crashing down. He offers some suggestions for improving the way we feel. Citing the positive effects on mood of gratitude and forgiveness, he argues that there is indeed power in positive thinking and in moral and spiritual endeavors. To make ourselves feel better, he suggests we might begin by making the world better. For him that means working to eradicate domestic poverty, bringing about universal health care, and reducing global underdevelopment. Others have argued that there may not be much we can do to alter the way we feel, at least permanently, because our capacity for happiness has a strong genetic component.

SUDDEN DEATH IN BAM, IRAN

On December 26, 2003, a 12-second earthquake and its aftershocks killed over 40,000 of Bam's 80,000 people and destroyed about 75% of the low-rise dwellings of clay tile, brick, and concrete block of this 2000-year-old city, located 610 miles southeast of Tehran (33, 34). The Iranian agencies measured the earthquake at 6.3 and American agencies at 6.7 on the Richter scale. An earthquake in Iran in 1990 had killed about 50,000 people. Our September 11, 2001, *unnatural* disaster in New York City killed approximately 2900 people.

ALL-TERRAIN VEHICLES

Sales of all-terrain vehicles (ATVs)—the 4-wheeled, motorcycle-like vehicles made to navigate rough terrain at speeds as high as 70 mph—climbed 89% between 1997 and 2002 (35). In 2002, manufacturers say they sold 825,000 ATVs in the USA, a figure exceeding sales of small pickup trucks. But as ATV sales have expanded to >\$3 billion a year, so have deaths and injuries,

particularly among children. There are more deaths and injuries on ATVs than on snowmobiles or personal watercraft. ATV use results in more injuries per vehicle than cars. Unlike cars, trucks, and motorcycles, ATVs are not subject to regulation by the National Highway Traffic Safety Administration because they are not designed for highway use. Only 10 states require that ATV drivers have a driver's license, and only 20 states require riders to wear helmets. Be careful.

ESTIMATING RISK

According to Baruch Fischhoff, people underestimate the risks of things they like, such as tobacco, bicycles, and favorite stocks, and they overestimate the risks of things they don't like, such as nuclear power (36).

TIME SPENT AT VARIOUS ACTIVITIES

The average American adult worked about 48 hours per week in 1995 and 53 hours per week in 2003 (37). The average American adult in 1920 slept 8.8 hours each day and in 2001, 6.8 hours each day. The average American talked nearly 15 hours each month on the land-line phone in 2000 and slightly less than 13 hours in 2003; in contrast, the hours per month on the wireless phone in 2000 was 4 hours and in 2003, 8.4 hours. Compared with 1992, the average American in 1999 spent more hours per day in exercise and sports (1.4 vs 1.3), in transit (1.5 vs 1.4), in caring for children and pets (1.9 vs 1.7), and in worship (1.9 vs 1.7). Between 1999 and 2003, the number of hours the average American spent per week on various media were as follows: broadcast TV decreased (19 vs 15); radio increased (18.7 vs 20.0); cable and satellite television increased (11.0 vs 18.7); recorded music decreased (5.7 vs 3.4); daily newspaper decreased (3.7 vs 3.2); magazines and books were unchanged; and Internet increased (0.3 vs 3.3). Since 1973 the median number of hours that people say they work has jumped from 41 to 49 a week, and leisure time has dropped from 26 to 19 hours a week over the same period. Overall TV viewing masks changes within different sectors of the population. More affluent households are also more likely to be Internet users, and Internet-using homes watch less TV than non-Internet-using homes.

JACK WELCH'S FOUR E'S

Jack Welch, the longtime chief executive officer of General Electric, has emphasized 4 essential traits of leadership, each one starting with an E: energy, energize, edge, execute (38). Successful leaders have tons of positive *energy*; they love action and relish change. They have the ability to *energize* others. They love people and can inspire them to move mountains when they have to. They have *edge*, the courage to make tough decisions: yes or no, not maybe. And, they can *execute*. They get the job done.

When Welch sees that a potential candidate for a leadership role has the 4 E's, he then looks for a final trait, namely *passion*, by which he means a heartfelt, deep, and authentic excitement about life and work. People with passion really care about neighbors, employees, colleagues, and friends winning. They love to learn and develop themselves and they get a kick when the people around them do the same. It is difficult to fake passion. Either people have a genuine zest for living and giving or they are just showing up.

Welch goes on to indicate that one cannot even start to think about the 4 E's until one gets a solid yes on 2 questions: 1) Does the leadership candidate have *integrity*, meaning does he or she tell the truth, take responsibility for past actions, and admit mistakes and fix them? Does he or she demonstrate fairness, loyalty, goodness, compassion? Does the candidate listen to others? Does the candidate truly value human dignity and voice? 2) Is the candidate *intelligent*, i.e., does the candidate have the breadth of knowledge, from history to science, which allows him or her to lead other smart people in a world that is getting more complex by the minute? The candidate has to have high levels of self-awareness, maturity, and self-control. The candidate must be able to withstand the heat, handle setbacks, and enjoy success with equal parts of joy and humility. Welch indicates that emotional intelligence is more rare than "book smarts," but he also suggests that the former is more important in the making of a leader.

—William Clifford Roberts, MD

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