Facts and ideas from anywhere

SO YOU WANT TO SEE YOUR HEART

Recently, I was walking in the corridors of Baylor University Medical Center at Dallas (BUMC) and suddenly was stopped and asked by a very kind man, "I understand, Dr. Roberts, that you have my heart?" He was Mr. Melvin A. Jones, who had had a heart transplant (No. 437) at BUMC in 2003. I told him, "Of course I have your heart. We keep these specimens for various studies." We arranged for Mr. Jones to see his heart at the weekly Cardiac Pathology Conference (*Figure 1*). Mr. Jones is asymptomatic and is living a very active life. He indicated that he has had 5 new grandchildren since his heart transplant!

Figure 1. Melvin Jones viewing his heart (a) with Dr. Roberts and (b) with cardiology fellows and other attendees at the Cardiac Pathology Conference. Photos by Jamie Ko.

INDIA AND CARDIOVASCULAR DISEASE

In August 2010, I was fortunate to have a whirlwind 10-day trip to India where I visited 9 cities, gave 11 presentations, and spent a total of 55 hours on the airplane. The cities included Delhi, Kolkata, Mumbai, Pune, Bhubaneswar, Trivandrum, Hyderabad, Bangalore, and Chennai. The trip was fascinating and rewarding. The Indians are very gracious, kind, hospitable, and generous people.

Unfortunately, despite a high frequency of vegetarianism among the Hindus, cardiovascular disease is beginning to skyrocket in that country, which has a third of the land area of the USA but 4 times as many people. Consumption of palm kernel oil, coconut oil, butter, ghee, and ice cream is quite high. The overweight frequency among adults in India is now 50%. Atherosclerotic cardiovascular disease comes with money, and the wealthier the population the higher the frequency of cardiovascular disease.

I visited the Sri Jayadeva Institute of Cardiovascular Sciences and Research in Bangalore and found that this exclusive heart hospital is the largest in the world. In 2008, 13,150 cardiac catheterization procedures including 7870 coronary angiograms, 2200 coronary angioplasties, 1250 balloon mitral valvuloplasties, 17,150 treadmill tests, and 85,000 echocardiograms were performed; 640 permanent pacemakers were implanted; and 1600 heart operations were performed, including 467 coronary bypass procedures, 455 valve replacements, and 654 operations for congenital heart disease; 19,500 patients were treated in the hospital and an average of 1000 patients were seen in the outpatient clinic each day (1). Ten cardiology fellows and 5 cardiothoracic surgery fellows are in training. The staff includes 35 cardiologists and 20 cardiovascular surgeons. It was an impressive institution. It is unfortunate that economic progress necessitates an increase in body weight and an increase in atherosclerosis.

OUR NATIONAL DEBT

Robert M. Doroghazi, MD, retired cardiologist in Columbia, Missouri, publishes *The Physician Investor Newsletter*, which appears at least bimonthly. A recent piece, "Our National Debt," summarized the problem well (2). The numbers are staggering: our federal government's new debt increases \$188 million each hour, \$4.38 billion each day, and \$1.6 trillion each year. The federal government's old debt amounts to \$42,000 per

person. Every 90 minutes, each of the approximately 310 million Americans via the federal government goes another \$1 in debt, about \$16 per day per person.

As Dr. Doroghazi indicated, the US government has 4 options on our national debt: 1) pay it off, 2) renege on it, 3) continue to refinance and rollover the debt, and 4) inflate the debt away. The first two options are very unlikely. The United Kingdom has been refinancing—option 3—since the late 17th century, and the US will continue to do so until there is a failed US bond auction, that is, an offering that is not completely subscribed. Regarding the fourth option, we have been inflating away our debt since the creation of the Federal Reserve in 1913. The Fed was created to do just that, to liberate the politicians from the discipline imposed by hard money. The printing presses, as Doroghazi emphasized, are the politician's ultimate dream. The US dollar, for example, was stable from 1792 until 1913. It has lost 98.5% of its value since then!

With these facts in mind, Doroghazi presented the following considerations. First, because liquidation of debt is deflationary, money will be pulled from circulation to service the debt. The only investment that gains in value during periods of deflation is cash, so he recommended that we stay liquid. Stay out of debt! Second, taxes will increase not only for some in 2011 but continually probably thereafter. Third, because every penny increase in taxes makes the traditional IRA/401k worthless, Doroghazi suggested converting some money currently in pretax plans to a Roth IRA or even withdrawing money in 2010 and paying the currently lower taxes. Fourth, buy US-minted gold and silver eagles and keep them in your safety deposit box. Finally, because states and cities are also having financial problems, defaults on municipal bonds will increase. He recommended muni-bond funds run by one of the big companies.

The Dallas Morning News ran a series on our national debt. Separate pieces by Todd J. Gillman and Jim Landers, both of the Washington Bureau, discussed the problem (3, 4). The USA has been on a spending spree for about 25 years. Debt makes it possible to buy things over time that are not affordable when they are desired, like homes and cars. When debt grows faster than income, paying back is difficult. In April 2010, US households had an outstanding balance on their credit cards averaging \$15,500. With a payment of \$25 a month, it would take about 17 years to retire that debt, assuming no additional debt. In March 2010, the average Dallas consumer owed just over \$26,500 on credit cards and loans covering cars, tuition, and other personal needs.

The US government is on a borrowing spree. For every dollar the US government spends, it borrows 40¢! In 2010, the US government is spending just under \$31,700 per American household. The occupants of the average US household pay \$19,500 in taxes. Of the federal government debt of \$8.572 trillion (not counting loans the government owes itself), \$4 trillion was borrowed from foreigners. China is our top creditor. It holds roughly \$1.2 trillion in US government debt. Even by 2020 it is projected that the US government will need to borrow 22¢ for every dollar it spends.

The wars in Iraq and Afghanistan have cost more than \$1.05 trillion so far, according to the Congressional Budget Office. Health care spending is the biggest worry in federal budget forecasts. In 2008, Medicare and Medicaid accounted for \$810 billion; in 2020 the Congressional Budget Office estimates the two programs will cost \$1.5 trillion. The federal office administering the new health care law estimates that it will increase federal spending on health care by \$251 billion. In 2010, the federal debt is expected to reach 63% of the size of gross domestic product; by 2020, 90%.

Projections in 2009 warned that Social Security would show a deficit beginning in 2017. The recession, however, has taken its toll, and the US government began borrowing from its trust fund in 2010.

Much of the debt currently is financed at low interest rates, so payments are very low compared with historical levels. The government spending on net interest is expected to triple in the next decade. This year it is estimated to be \$207 billion and by 2020, \$723 billion. It is projected that Medicare will show a deficit under current spending trends within 8 years. The Congressional Budget Office has projected that in 2020, Medicare and Medicaid will comprise 28% of the budget; Social Security, 22%; defense, 15%; net interest, 14%; and other spending, 21%.

SOME SOCIAL SECURITY FACTS

Scott Burns (5) recently summarized some facts on Social Security that seem useful for all of us to know.

1. Social Security is the largest single source of income for retirees. It accounts for 40% of income for those aged ≥65 years.
2. The program has lots of money coming in. Employment tax collection in fiscal year 2009 yielded a total of \$654 billion and accounted for 31% of all federal revenue.
3. Employment tax collections exceeded benefit payments from 1983 to the present. During those 27 years, the surplus was spent by presidents of both parties and by both Democrat- and Republican-controlled Congresses. But Congress took these retirement savings and gave us IOUs from the US Treasury. The Social Security Trust Fund is now nominally worth \$2.3 trillion, but the Treasury has no money to make good on its bonds because our government is already running a gigantic deficit.
4. The money could not have been invested elsewhere because it would have overwhelmed the private investment markets.
5. Paying down the existing federal debt is the only way that extra \$2.3 trillion would have benefited future retirees. This would have required that the regular US budget be balanced, an event that has occurred only 3 times in the last 50 years (1960, 1999, and 2000).
6. We can't blame it all on the politicians. When Social Security was created in 1935, the life expectancy at birth of American men was 58 years. It has been growing ever since and hit 75 years in 2005. It costs more to live longer.

7. We can solve the problem by reducing our life expectancy. If we died at the age people die in Russia, Social Security would have no problems, but most people would rather die at 78 than at 66. We have a problem of success, not failure.
8. It is still good to defer Social Security benefits. Even under the worst-case scenario, tax revenue will still cover about 75% of benefits through 2037.

OBAMACARE

The pediatrician and Harvard University professor that President Obama appointed in July 2010 to run Medicare and Medicaid will play a central role in implementing the nation's new health care law (6). *Donald Berwick* will head the Centers for Medicare and Medicaid Services, which has an annual budget of more than \$800 billion and oversees programs for >90 million enrollees. Berwick will also try to find a way to trim about \$500 billion out of Medicare over the next decade by expanding Medicaid coverage to an additional 16 million people.

Donald Berwick was made the recess appointee to run Medicare/Medicaid rather than have his philosophy debated in the Senate. An unsigned editorial in *The Wall Street Journal* quoted him as saying, "Any health care funding plan that is just, equitable, civilized and humane must—must—redistribute wealth from the richer among us to the poorer and less fortunate" (7). According to *The Wall Street Journal*, ObamaCare's new "health care funding plan" will shift \$104 billion in 2016 to Americans in the bottom half of the income distribution from those in the top half. The wealth transfer will be even larger in future years. While every income group sees a direct or indirect tax increase, everyone below the 50th income percentile comes out a net beneficiary. At least at the start, Americans in the 50th through 80th income percentile—those earning between \$99,000 and \$158,000—are nearly beneficiaries too. At the beginning the biggest losers are the upper-middle class, especially the top 10% of income earners, mainly because of a 3.8% Medicare "payroll" tax surcharge that will now apply to investment income.

In short, ObamaCare, according to *The Wall Street Journal*, is almost certainly the largest wealth transfer in American history. ObamaCare is essentially a complex rewrite of health, tax, welfare, and labor laws. With his vast new powers over what government spends, Dr. Berwick will be well situated to equalize outcomes even more, and he certainly seems inclined to do so. The great irony is that this sort of enforced egalitarianism imposes higher taxes and other policies that reduce the total stock of wealth and leave less for Dr. Berwick to redistribute. Economic growth historically has been by far the most important factor in improving health and longevity.

THE PHYSICIAN PAYMENTS SUNSHINE ACT

The law signed by President Obama on March 23, 2010, includes provisions to enhance transparency in the relationships between physicians and the makers of products paid for by Medicare, Medicaid, or the state Children's Health Insurance Program (CHIP) (8). These provisions aim to prevent physicians

and companies from concealing potential financial conflicts of interest. While the new law does not prohibit financial relationships between manufacturers and physicians or teaching hospitals, it requires manufacturers to disclose individual payments or goods or services with a value of \$10 or more and cumulative payments or gifts exceeding \$100, including travel, meals, consulting fees, honoraria, research funding, and royalties. Samples, loaner devices, educational materials for patients, and certain investments are excluded.

Previously, some pharmaceutical companies and a few states had established databases of payments to clinicians. But the federal database, which will be administered by the Department of Health and Human Services (DHHS), will include more comprehensive information. For example, it will indicate the specific drug or device the payment was intended to promote. It will also be searchable. It will provide institutions easier access to information about an individual's commercial relationships, allowing them to verify voluntary disclosures. The federal database will not include information about payments to nonphysician providers of health care and nonteaching facilities. Manufacturers who do not comply will face fines ranging from \$10,000 to \$1 million per year.

The law requires manufacturers to begin recording payments in 2012 and to report them to DHHS by March 2013. The database will be available to the public by September 2013. The provisions also require DHHS to submit annual reports on the data to Congress and to each state. Whether this new law will be good or bad for the patient or the physician or the teaching hospital remains to be seen.

POSTGRADUATE MEDICAL EDUCATION

There are two major types of medical courses for physicians who have finished their official residency or houseofficer training. One is *continuing medical education* (CME), where the sponsor provides medical education credits to the enrolled physicians. The second is *industry-sponsored medical education*, which does not provide CME credits. Through the years I have given presentations at both types of educational programs and have enjoyed both, and I have given essentially the same talks at both type of programs. I have no stocks in any pharmaceutical or device-producing company and have given talks sponsored by differing pharmaceutical companies, so I have never felt abnormally biased in either of these endeavors.

In the last year or so, the industry-sponsored courses have changed dramatically. In the past when I participated in them, I gave presentations using a flip chart. I enjoyed it because I wasn't locked in to any slide material and I could alter the presentation by particular comments or questions from one or more enrollees. But that is not possible anymore. If one gives a presentation sponsored by a pharmaceutical company, one has to show PowerPoint slides produced by that pharmaceutical company! The reason is that those slides have been vetted by the legal arm of the pharmaceutical company, and the lawyers apparently are responding to how they interpret the edicts of the U.S. Food and Drug Administration (FDA). Thus, the ability of a teacher is enormously controlled by these requirements.

The approved slides are the only ones speakers can use. Generally, the sponsoring company sends 70 to 100 slides to potential speakers, who then choose among them. Several company-produced slides must be shown. The key is to have a balanced presentation and to present all sides of the argument, not only efficacy of various drugs but also their potential side effects. The only time in these industry-sponsored courses that speakers can give their own interpretation is when a question is asked, and if speakers answer a question concerning an off-label indication, they must state that. To emphasize, no speakers are allowed to show any of their own prepared slides! CME programs are different in that speakers must show their own slides, but many speakers and probably most use some slides prepared by pharmaceutical companies because they are generally better than ones prepared by individual physicians.

CME courses have been supported in part at least by grants from pharmaceutical companies, but that too is beginning to diminish. I am dean of CME at BUMC, and in the past many of our CME courses were made possible by grants from pharmaceutical companies. Grant money is disappearing or at least diminishing enormously such that our educational programs will also have to diminish. The University of Michigan Medical School decided in June 2010 that it no longer would allow pharmaceutical companies to provide grants for CME courses sponsored by their CME department. That decision will cost the University of Michigan about \$1 million a year.

The debate over whether the medical profession should develop an industry-free model of postgraduate education is a delicate one (9). The debate has led this year to public squabbles as physician groups have squared off over proposals for new restrictions on industry involvement in the CME courses. The accrediting body for postgraduate medical education recently said it would no longer grant credit to physicians for attending medical meetings that feature industry employees presenting product research. That decision was met with howls of dissent in June 2010 from some physicians, including the director of the National Institutes of Health and the president of the American Heart Association (BUMC's Dr. Clyde W. Yancy), who said it would unfairly cut physicians off from scientific knowledge. On the other side of the argument is Dr. Bernard Lo, lead author of a 2008 Institute of Medicine report on conflicts of interest, who said that private and academic physicians who are paid to speak for drug companies should be barred from presenting educational material at accredited conferences, i.e., CME courses.

Private medical education companies, which receive money from drug makers to produce such courses, and some doctors who lead the courses disagree that industry financing or speaking leads to bias. I agree with that view and believe that company-financed programs provide a vital service, keeping physicians up-to-date on the latest and most effective treatments.

CME has become a big business in the USA, with more than 700 accredited providers. Total spending on such courses peaked at \$2.5 billion in 2007, including a record \$1.2 billion paid by companies, according to the Accreditation Council for Continuing Medical Education. The amount has declined

slightly since then as new limits on industry involvement have been introduced. Some argue that the accreditation system is built with checks and balances to prevent industry influence over course selection or content. The courses themselves are intended to improve patient care, not to promote a particular brand of treatment.

There is a paucity of rigorous science investigating the potential for commercial bias in CME courses. Proponents of industry support for such courses point to a few studies in which the majority of physicians who attended the programs reported that they perceived the events to be free of commercial bias.

I happen to believe there should be a closer rather than a more distant relationship between physicians and industry. I have learned a great deal from various pharmaceutical representatives, and by seeing quite a few of them I have learned to play one bit of information parlayed by one group against that by another. The last drug created by physicians to my knowledge was in the 1930s (warfarin). The pharmaceutical industry comes up with the new drugs, and some of them are miracles in my opinion. The only question is *what is best for the patient*, and what's best for the patient is for the physicians to learn as much as possible about every disease and every treatment, and some of that information can easily be obtained at minimal or no expense from the pharmaceutical industry.

MEDICAL EDUCATION IN CHINA

In March 2009, the Chinese government launched a major health reform (10). Although many factors will affect the success of the reform, medical education is key for successful development of their health system. After the People's Republic of China was established in 1949, China adopted the Soviet model of autonomous medical universities, offering mostly 5-year or 6-year degrees. The Cultural Revolution in 1966–1967 disrupted higher education but also led to barefoot doctors bringing health services to rural populations. Since 1980, China has prioritized steady growth and development of its medical universities. Although the focus is on clinical practice, higher medical education in China includes clinical medicine (physicians), preventive medicine (public health workers), dentistry, forensic medicine, medical laboratories, nursing, and pharmacy. China has 159 institutions of higher education for medicine, with almost 1.7 million students, and had >400,000 new graduates in 2008. An equally sizable secondary vocational system that trains lower-level medical workers sits alongside these institutions.

China's educational programs are complicated. Students of clinical medicine enroll directly from high school for degrees that last 3 (diploma), 5 (bachelor), 6 (bachelor), 7 (master), or 8 years (MD). A stepwise system also exists, in which students progress from bachelor's degree to master's degree for 3 years and then to MD or PhD for another 3 years, with a possible gap between degree courses.

China's educational system faces many challenges because of its scale and complexity. The government has prioritized faculty development, quality standardization, curriculum reform, and accreditation to improve medical education.

The rapid expansion of medical education since 1998 might be compromising quality and producing graduates unable to find jobs. Provincial schools have experienced unprecedented expansion over the past decade. Yearly enrollment into higher medical education increased 6-fold from 75,000 in 1998 to nearly 450,000 in 2008. Some institutions admit 2000 to 3000 medical students every year, numbers that necessitate compromises, such as the replacement of anatomy with multimedia learning and a scarcity of clinical clerkships. Student-teacher ratios in higher medical education nearly tripled from 7 in 1998 to 20 in 2008, leading to concerns about quality. A surplus of medical graduates is accompanied by an unequal distribution of health workers in urban and rural areas.

Standardized residency programs started in China in 2003, and the Ministry of Health has certified 1112 training sites. Residents are expected to be trained in these sites before permanent employment. The Ministry of Health, however, has not solved the issues of funding, recruitment, and revision of laws to allow residents to work clinically shortly after their undergraduate training.

Although challenges are sizeable, China has made good advances in the past few decades. Whether improvement in medical education will match the rapid advancements of China's economy remains to be seen.

TOBACCO PRODUCT REGULATION

On June 22, 2009, President Barack Obama signed the Family Smoking and Prevention Control Act. This legislation provides the FDA with the authority to regulate tobacco products (11), the leading cause of preventable death in the USA. Since the 1964 report by Surgeon General Luther Terry, medical and public health service professionals in many US states and communities have worked to curb tobacco use and tobacco-related diseases through measures such as taxation, laws regarding indoor air quality, public health education, and litigation. From 1965 to 2004, per capita yearly consumption of cigarettes among US persons aged ≥ 18 years decreased from 4258 to 1814. Still, tobacco use causes $>400,000$ deaths in the USA annually, and >8.5 million Americans have chronic illnesses related to smoking. In a 2007 national survey, 1 in 4 high school students reported that they currently used tobacco. Each day, roughly 3900 Americans 12 to 17 years of age start smoking cigarettes; 1000 become regular users.

The FDA's involvement with tobacco dates back to 1995, when the agency determined that cigarettes and smokeless tobacco products were nicotine-delivery devices that fell within the scope of the federal Food, Drug, and Cosmetic Act. In 2000, however, the US Supreme Court found that the FDA did not have jurisdiction over tobacco products as they are customarily marketed, impeding the agency's efforts to restrict the availability of these products and their appeal to young people. That decision set in motion the campaign that led to the passage of the Tobacco Control Act. The FDA is implementing this law as part of a comprehensive effort to reduce the toll of disease, disability, and death caused by tobacco. The cigarette is the only consumer product that when used as directed kills

the consumer! The law therefore instructs the FDA to regulate tobacco products to protect the public health and contains a standard for the agency to apply in doing so—one that is more appropriate for inherently dangerous tobacco products than is the "safe and effective" standard use for other FDA-regulated products.

FEDERAL REGULATION OF SALT CONTENT OF CERTAIN FOODS

A report, *Strategies to Reduce Sodium Intake in the United States*, from the Institute of Medicine (IOM) recommended that the FDA set standards for the salt content of processed and restaurant foods (12, 13). The IOM recommendations came at the request of Congress, which charged the institute with developing strategies to reduce the population's intake of sodium to levels consistent with the US government's Dietary Guidelines for Americans. These guidelines call for a daily sodium intake of no more than 2300 mg (about 1 teaspoon of salt); adequate daily intake is set at 1500 mg and is even lower for those >50 years of age.

These recommendations, of course, are meant to reduce our blood pressure, which is elevated in nearly two thirds of us. Reducing daily sodium to 2400 mg could reduce the number of deaths by 100,000 annually and lower the direct and indirect costs of hypertension, which were \$73 billion in 2009.

The IOM recommended that the FDA modify the generally recognized as safe (GRAS) status of salt added to processed foods. According to federal law, any substance intentionally added to food is a food additive and subject to FDA oversight, unless it is designated as GRAS. Once the GRAS status is changed, the FDA could then require reductions in the salt content of the food supply in a stepwise manner. The same mechanisms would also allow the FDA to gradually require restrictions in the salt content of menu items offered by restaurants and food service operations. The IOM report also urges the food industry to voluntarily reduce the sodium content of its foods before the FDA implements mandatory standards.

The FDA said it would thoroughly review the IOM's recommendation and would formulate plans for how it can continue to work with other federal agencies, public health and consumer groups, and the food industry to support the reduction of sodium levels in the food supply.

MARKERS FOR LONGEVITY

Researchers at Boston University studied >1000 people >100 years of age and identified 150 unique genetic markers that, taken together, are linked to extreme longevity (14). They did not know all the genes involved or their exact function in extending old age. While a healthy lifestyle is paramount, such genetic factors appear to become more important the longer we live. A variation in a single key gene called *FOXO3A* can triple the chances a person may live past 100, according to Sebastiani and colleagues in their *Science* article (15).

These investigators studied variations in the biochemical code of DNA drawn from members of the New England Centenarian Study, considered the world's largest comprehensive study of long-lived people and their families. The scientists compared

the genetic makeup of these centenarians with people who had shorter life spans. The genetic markers they found were scattered across the entire 3 billion DNA characters of the human genome and touched on at least 70 known genes. Depending on personal habits, diet, injuries, accidents, and other factors, these genes boosted an individual's chances of survival. The information allowed the Boston University researchers to identify those predisposed to exceptional longevity with 77% accuracy. The challenge now is to find out what all these genes are, what they do, and if there is a way that they can be affected.

The researchers plan to make a free test kit available through a public website maintained by the New England Centenarian Study. To take the test, however, people will have to provide their own complete genome, which currently can cost thousands of dollars, from gene sequencing companies.

GERONTOLOGY

It is the study of aging and medicinal tools to block its unwanted effects. In 1923, at age 67, Sigmund Freud had a vasectomy. By signing up for the "Steinach operation"—a procedure named for the Austrian endocrinologist Eugen Steinach—the famed psychiatrist was less concerned with sex than he was with longevity. Nearly a century ago it was believed that tying off one's spermatic cords could thwart the effects of aging.

In the succeeding decades, scientists have moved from one idea to another in search of a procedure or pill that could lengthen life. David Stipp has summarized this area in his new book, *The Youth Pill* (16). It turns out that the most compelling theory has settled on a series of genes that are activated when people are fed a low-caloric diet. This science of *caloric restriction* (CR) stems from studies of an eccentric group of people who engage in near-starvation diets as a way to extend their lives. Mr. Stipp believes that this line of research holds the best promise of a pharmaceutical product that could slow the degenerative effects of aging. There is general agreement in gerontologic circles that the biologic effects of CR can counter benefits, such as modulating our endocrine systems to lower our levels of blood sugar. But that's where the consensus unravels. Scientists spar over the precise genes (dubbed gerontogenes) that govern any aging effects and over what drugs are best suited to target them.

PHYSICAL FITNESS OF TEXAS SCHOOL CHILDREN

An annual study of Texas school children has found that few reached benchmarks for physical fitness by the state and that the percentage that reached the benchmarks dwindled as students age (17). While less than a third of third graders passed the test, just over 8% of 12th graders did. The Fitnessgram aims to measure aerobic capacity by running or walking; body composition either as a percentage of body fat or body mass index; and muscular strength, endurance, and flexibility as measured by exercises such as push-ups or sit-ups or abdominal curls or various stretches.

WAIST CIRCUMFERENCE AND MORTALITY

As my friend Bob Vogel in Baltimore, Maryland, has said, "The waist is the first thing that enters the room and does not necessarily correspond with the belly button." Jacobs and col-

leagues (18) from Atlanta, Georgia, measured the waist circumference in 48,500 men and 56,343 women aged ≥ 50 years. Of them, 9315 men and 5332 died between 1997 and the end of the follow-up in 2006. The authors found that very large waist circumferences were associated with an approximately 2-fold higher risk of dying in both men and women, and waist circumference was positively associated with mortality within all categories of body mass index. These results emphasize the importance of waist circumference as a risk factor for mortality in older adults regardless of body mass index. The inexpensive measuring tape is a very useful tool to have in the white-coat pocket.

HOT FLUSHES AND WEIGHT LOSS IN WOMEN

Huang and colleagues (19) from several US medical centers studied women who were overweight or obese and had bothersome hot flushes and found that an intensive weight-loss intervention program resulted in improvement in hot flushes compared with the control group. Thus, another benefit of weight loss.

AIRLINE FOOD

FDA inspectors recently cited numerous catering facilities that prepare airline food for suspected health and sanitation violations following inspections of their kitchens both in 2009 and 2010 (20, 21). The inspections were at US facilities of two of the world's airline caterers, which operate 91 kitchens that provide >100 million meals annually to US and foreign airlines at US airports. The FDA report said that many facilities store food at improper temperatures, use unclean equipment, and employ workers who practice poor hygiene. At some, there were cockroaches, flies, mice, and other signs of inadequate pest control. These conditions, of course, open the door to food poisoning, which on occasion can be very dangerous.

HOT DOG EATING CHAMPION

Major League Eating—the fast-food equivalent of the National Football League—has multiple contests annually. The annual Coney Island Fourth of July contest in 2010 was won by competitive eater 26-year-old Joey "Jaws" Chestnut, who won his fourth consecutive championship by downing 54 hot dogs in 10 minutes to win the annual Nathan's Famous International Hot Dog Eating Contest (22). He was awarded a bejeweled mustard-yellow belt plus \$20,000. There are 309 calories in each Nathan's hot dog!

VITAMIN D AND HEALTH

Vitamin D has been known for many years to play a critical role in skeletal health, such that very low levels of this hormone (<20 nmol/L) can cause osteomalacia, a disorder of impaired bone mineralization. More recently, observational studies have reported inverse associations between levels of serum 25-hydroxyvitamin D (25[OH]D), the metabolite that best reflects overall vitamin D status, and the risk of a wide range of diseases, including cancer, vascular disease, infectious conditions, autoimmune diseases, osteoporosis, type 2 diabetes mellitus, and obesity. Most recently, Llewellyn and colleagues (23) reported in a prospective cohort study of 858 Italian adults

≥65 years that baseline levels of serum 25(OH)D were inversely related to the rate of cognitive decline during a median follow-up of 6 years. This effect was most apparent in participants with the lowest levels of 25(OH)D (<25 nmol/L) and persisted after adjusting for several potential confounding variables. Thus, accelerated cognitive decline is now added to the list of conditions that have been associated with lower levels of vitamin D.

Grey and Bolland (24) from Auckland, New Zealand, wrote an accompanying editorial questioning the results of these observational studies, which have prompted calls for widespread treatment of individuals with low levels of vitamin D and the establishment of public health programs aimed at raising the population levels of vitamin D to “healthy” values. The proponents of such actions regard “sufficient” levels of 25(OH)D to be >75 nmol/L (and in some instances >100 nmol/L) based on results from observational studies. Current evidence suggests that most individuals in the general population have 25(OH)D levels <75 nmol/L for a substantial part of the calendar year. Thus, achieving the advocated levels will require supplementing a considerable proportion of the population. The view of Grey and Bolland is that it is unlikely that a single hormone could play a substantial role in preventing or ameliorating the diverse range of diseases that have been linked to low levels of vitamin D. They believe a more plausible explanation for the findings of the observational vitamin D studies is the presence of common confounders. Vitamin D levels are directly related to sunlight exposure and physical activity and inversely related to adiposity. It is likely that less healthy individuals, who are more likely to subsequently experience morbid events, will be heavier, less active, and more sunlight-deprived than healthier ones and therefore have lower levels of 25(OH)D. This notion is supported by previous studies and by the study of Llewellyn and colleagues, in which several indices of poor health were more commonly observed at baseline in those with lower levels of vitamin D. Thus, low vitamin D levels may simply be a marker for lower health status rather than a cause of it. Grey and Bolland suggest that we treat the data from observational studies of vitamin D with caution.

Randomized controlled trials provide a rigorous evaluation of the hypotheses generated by the results of observational studies. To date, only a few randomized controlled trials of vitamin D supplementation have addressed nonskeletal endpoints, and none have been designed to assess important “hard” outcomes such as cancer incidence or vascular events. Findings from randomized controlled trials of vitamin D supplementation that have fracture as an outcome or that have surrogate measures of nonskeletal health as outcomes suggest that observational studies of vitamin D have also produced misleadingly optimistic results. Vitamin D supplementation does not reduce overall fracture risk and may increase the risk of the most serious fragility fracture—that of the proximal femur. When coadministered with calcium supplementation, vitamin D produces a marginal reduction in fracture risk that is comparable to that produced by calcium alone. Recent randomized controlled trials of vitamin D supplementation similarly have failed to demonstrate positive effects on body weight, glycemic control in type 2 diabetes mel-

litus, incidence of type 2 diabetes, and incidence of respiratory infection. Advocates for vitamin D supplementation maintain that the fracture trials failed to adequately characterize the vitamin D status of participants and/or used inadequate doses. Evaluation of “adequate” doses in clinical trials has not been undertaken. According to Grey and Bolland, evidence for recommending vitamin D supplementation for improving health outcomes, either skeletal or nonskeletal, in community-dwelling individuals does not currently exist beyond the avoidance of vitamin D levels that can produce osteomalacia. Until the various hypotheses generated by observational studies of vitamin D are tested in adequately designed and randomized controlled trials, I will continue to take vitamin D in a daily multivitamin, most of which contain 400 or 800 IUs of vitamin D.

PROSTATE GLAND CANCER

Researchers at the University of Michigan identified 24 types of prostate cancer with varying degrees of virulence (25). About 50% to 60% of them grow slowly and are minimally aggressive. At the other extreme are 10% to 15% that grow quickly and are very aggressive. About 218,000 American men will be diagnosed with prostate gland cancer in 2010. An estimated 85% of those neoplasms will grow so slowly that they will never cause problems. The rest are aggressive and lethal. As of now, there is no way to tell early on which cancers are which, so tens of thousands of men undergo surgery or radiation each year for cancers that never needed treatment, risking impotence or incontinence in the process.

Researchers at Memorial Sloan-Kettering Cancer Center in New York have identified other genetic subtypes of prostate cancer that seem to predict whether the tumor will be low risk or high risk. At Harvard a specific gene that causes prostate cancers to spread has been found. Some of the discoveries may lead to new treatments, tailored specifically for the kind of prostate tumor a man has. Unfortunately, these new tests are not yet available.

ANTIBIOTICS AND LIVESTOCK

The livestock industry is the nation's biggest consumer of antimicrobial drugs—using tens of millions of pounds annually (26). In June 2010, the FDA stepped up its campaign to discourage the use of human antibiotics in farm animals because of the worry about the rise of drug-resistant pathogens. The agency drafted a guidance paper advising the livestock industry to stop feeding antibiotics to healthy hogs, chickens, and cattle, commonly done because they tend to speed their growth. Although the FDA's guidance is not legally binding, it sets the stage for the agency to take regulatory action. The FDA's move comes amid concern from the medical community that heavy use of antibiotics is generally spurring the evolution of drug-resistant pathogens.

REPEAT CESAREAN SECTION

In July 2010, the American College of Obstetricians and Gynecologists announced an easing of restrictions on who might avoid a repeat cesarean section (27). Most women who have had

a cesarean and many who have had two should be allowed labor with their next pregnancy, according to the new guidelines—a step towards reversing the “once a cesarean always a cesarean” policy. Fifteen years ago, nearly 3 in 10 women who had a cesarean gave birth vaginally the next time. Today, <1 in 10 do that. In 2009, a National Institutes of Health panel strongly urged steps to reverse that trend, saying a third of hospitals and half of physicians banned women from attempting vaginal birth after cesarean (VBAC). The new guidelines declare VBAC a safe and appropriate option for most women—including those carrying twins or those who have had two cesareans.

Overall, nearly one third of US births are by cesarean, an all-time high. Cesareans can be life saving, but they come with certain risks—and the more cesareans a woman has, the greater the risk in the next pregnancy of problems like placenta abnormalities or hemorrhage.

The main debate with VBAC is that labor could cause the scar from an earlier cesarean to rupture. There is a <1% chance of that happening, the guidelines said. Also, with most recently performed cesareans, that scar is located on a lower part of the uterus that is less stressed by contractions.

Of those who attempt VBAC, 60% to 80% will deliver vaginally, the guidelines noted. The rest will need a cesarean after all, because of stalled labor or other factors. Success is more likely for those who go into labor naturally and is less likely in women who are obese or are carrying large babies. A successful VBAC is safer than a planned repeat cesarean, especially for women who want additional children, but an emergency cesarean can be riskier than a planned one. Dr. F. Gary Cunningham from the University of Texas Southwestern Medical Center, who chaired the National Institutes of Health panel on repeat cesareans, urged educating women about their options early enough in pregnancy for them to make an informed choice.

A SINGLE SCREENING QUESTION FOR ILLICIT DRUG USE

Smith and colleagues (28) from Boston, Massachusetts, validated a single-question screening test for illicit drug use and nonmedical use of prescription drugs. Adult patients recruited from primary care waiting rooms were asked, “How many times in the past year have you used an illegal drug or used a prescription medication for nonmedical reasons?” A response of at least 1 time was considered positive for drug use. The single screening question was 100% sensitive and nearly 75% specific for the detection of a drug use disorder.

CHILDLESSNESS

Findings from the recent census show that among all women aged 40 to 44 in the USA, about 18%, or 1.9 million, were childless in 2008 (29). That is up from 10% or nearly 580,000 in 1976. Since 1994, childlessness for blacks and Hispanics has grown by 30%, about 3 times the rates for non-Hispanic whites. These numbers coincide with broader US trends of delayed marriage and increased opportunities for women, who now outnumber men in the workforce and have drawn even with men in advanced degrees. After reaching a high of 3.7 children per woman during the baby boom (1947–1964), the

US fertility rate dropped to a historic low of 1.7 during the mid 1990s and now stands at about 2.0. The findings also showed a historic demographic shift in which blacks, Hispanics, Asians, and multiracial cultures are growing rapidly in the US. Minority babies now make up nearly half of all births in the USA.

RIGHT TO DIE

In a landmark ruling, Germany’s highest court ruled on June 25, 2010, that it was not a criminal offense to cut off life-sustaining treatment from a patient (30). The court overturned the conviction of a lawyer who had been found guilty of attempted manslaughter for advising a client to sever the intravenous feeding tube that was keeping her mother alive, although she was in a persistent vegetative state. The mother had told her daughter that she did not wish to be kept alive artificially. The verdict is likely to spur significant changes in the practice of assisted suicide and is certain to restart the debate over euthanasia and the right to die in Germany. In the decision, the court clearly distinguished between “killing with the aim of terminating life” and an action to “let a patient die with his or her own consent.” The ruling of course strengthens an individual’s right to die with dignity, since ending life-sustaining treatments will no longer be a crime if patients have declared their wishes. Euthanasia with the consent of the patient—sometimes called voluntary euthanasia—is already legal in Belgium and Switzerland. It is an especially difficult issue in Germany because the Nazis used the term “euthanasia” as cover for a mass extermination program of disabled people.

DRIVER DISTRACTIONS

Amy N. Ship of Harvard Medical School had a splendid piece on various distractions drivers experience (31). She began with the story of three young women traveling in a car one sunny morning when the traffic was light. They were all wearing seatbelts and were not intoxicated. They were talking about a friend. The driver decided to include another friend in the conversation and while steering sent him a short text message on her cell phone. Suddenly the car swerved into oncoming traffic. Metal hit metal, bodies were thrown, glass broke, and blood splattered. She had just killed her two friends by texting.

Although it is difficult to assess the absolute increase in the risk of collision attributable to driver distraction, one study showed that talking on a cell phone while driving posed a risk 4 times that faced by undistracted drivers and on a par with that of driving while intoxicated. Another study showed that texting while driving might confer a risk of collision 23 times that of driving while undistracted. Although there are many possible distractions for drivers, >275 million Americans now own cell phones, and 80% of them talk on those phones while driving. The adverse consequences have reached epidemic proportions. At least 1.6 million traffic accidents (28% of all crashes) in the USA are caused by drivers talking on cell phones or texting. Talking on the phone causes many more accidents than texting, simply because more drivers talk than text, and using a hands-free device does not make talking on the phone safer. All but 11 states now have passed laws regarding cell phone use while driving.

Dr. Ship emphasized that her students and residents routinely query patients about habits associated with harm, asking about the use of helmets, seatbelts, condoms, cigarettes, alcohol, and drugs. Recently she added a question about driving and distractions to her annual patient review of health and safety. She indicated that she usually begins with a seatbelt question and then asks, “Do you text while you drive?” If a patient admits to texting while driving, she explains that talking on the phone while driving actually causes more accidents than texting. She has found it more powerful simply to say that driving while distracted is roughly equivalent to driving drunk, a statement that captures both the inherent risk and the implied immorality. She asks patients whether they could reduce or abstain from cell phone use while driving. Some more resistant patients ask why talking on the phone, even with a hands-free device, is more dangerous than talking to a passenger in the car. Maneuvering a phone is more complicated than talking to a passenger. Sometimes when patients aren’t convinced, she asks them, “How would you feel if the surgeon removing your appendix talked on the phone—hands-free of course—while operating?” This hypothetical question captures the essence of the problem. She finished her article with this:

Primary care doctors are uniquely positioned to teach and influence patients; we should not squander that power. A question about driving and distraction is as central to the preventive care we provide as the other questions we ask. Not to ask—and not to educate our patients and reduce their risk—is to place in harm’s way those we hope to heal.

COMMOTIO CORDIS

Barry J. Maron and colleagues (32) have written extensively about commotio cordis in the past 10 years. The generally agreed upon definition of this entity includes a sudden, usually instantaneous death from a nonpenetrating chest blow in the absence of underlying cardiovascular disease and structural damage to the ribs, sternum, or heart muscle (i.e., cardiac concussion). The definition is necessary to distinguish commotio cordis from “cardiac contusion” in which potentially lethal arrhythmias are derived directly from myocardial bruising.

Stephen D. Boran (33) pointed out that commotio cordis has been around for many decades even though it has largely gone unrecognized. Boran emphasized how commotio cordis was described 18 times (and in great detail) in the chronology section of the 1905–1910 *Reach’s Official American League Baseball Guide*. The chronology section typically included the name and age of the player who died, the city in which the death occurred, the circumstances surrounding the death, and a note about whether the person died instantly or not. Unfortunately, Reach stopped publishing this report after the 1911 guide.

HEART ATTACKS DECREASING

Yeh and colleagues (34) from Boston, San Francisco, and Oakland identified 46,086 hospitalizations for acute myocardial infarction (AMI) during 18,691,131 person-years of follow-up from 1999 to 2008. The AMI incidence fell from 287 cases per 100,000 person-years in 2000 to 208 cases per 100,000

Figure 2. Age- and sex-adjusted incidence rates of acute myocardial infarction, 1999 to 2008. I bars represent 95% confidence intervals. MI indicates myocardial infarction; STEMI, ST-segment elevation myocardial infarction. Reprinted with permission from Yeh et al, 2010 (34). Copyright © 2010 Massachusetts Medical Society. All rights reserved.

person-years in 2008, a 24% relative decrease. ST-segment elevation AMI decreased throughout the study (from 133 cases in 1999 to 50 cases per 100,000 person-years in 2008) (Figure 2). Additionally, 30-day mortality was significantly lower in 2008 than in 1999. The lower incidence of AMI—particularly ST-segment elevation AMI—is probably explained, at least in part, by substantial improvements in primary prevention efforts. These trends occurred despite the increased sensitivity of new biomarkers for the diagnosis of AMI and the increasing prevalence of certain cardiovascular risk factors.

Another study, this one by Chen and colleagues (35) from New Haven and Boston, also showed recent declines in hospitalization for AMI. These authors studied Medicare fee-for-service patients hospitalized in the USA with a principal discharge diagnosis of AMI from 2002 to 2007. The annual AMI hospitalization rate in this population fell from 1131 per 100,000 beneficiary years in 2002 to 866 in 2007—a 23% decline. White men experienced a 24% decrease in AMI hospitalization, whereas black men experienced an 18% decrease during the 5-year period. White women had a 23% decline and black women had an 18% decline in AMI hospitalization during the 5 years.

IMPROVED HYPERTENSION CONTROL

Egan and colleagues (36) from Charleston, South Carolina, provided new information on hypertension awareness, treatment, and control rates compiled from the 2007–2008 National Health and Nutrition Survey (NHANES). They compared their new findings with findings from NHANES surveys in 1988. Awareness of hypertension increased from 72% to 81%, treatment from 61% to 73%, and control (defined by systolic blood pressure level of <140 mm Hg and diastolic blood pressure level of <90 mm Hg) from 35% to 50%. The 50% control rate meets the Healthy People 2010 objective (37). This is good news. Stroke and aortic dissection should decrease accordingly.

ATRIAL FIBRILLATION AND BODY WEIGHT

Over the past 3 decades there has been a rapid increase in the prevalence of atrial fibrillation (AF), which is not entirely explained by the aging of the population. At present, an estimated 2.3 million people have been diagnosed with AF in the USA, and

AF accounts for 75,000 to 100,000 strokes per year. If this rapid growth continues, the number of individuals with AF is expected to increase to 12 million by 2050. Once AF develops, treatments aimed at eliminating it are associated with limited long-term success and nonnegligible risk. Even when treatment is apparently successful, asymptomatic AF may persist, and the risk of stroke may never be eliminated. Therefore, the identification of modifiable risk factors for development of AF is very important.

Tedrow and colleagues (38) from multiple medical centers from Boston and Basel examined confirmed cases of AF by medical record review in 34,309 women in the Women's Health Study. During 12.9 ± 1.9 years of follow-up, 834 AF events were confirmed. Body mass index was linearly associated with AF risks, with a 4.7% increase in risk with each kg/m^2 increase. Overweightness, whether obese or nonobese, was associated with short-term increases in AF risks. Participants becoming obese during the first 60 months had a 41% increase in risk of development of AF compared with those maintaining body mass index $<30 \text{ kg}/\text{m}^2$. Thus, in this population of apparently healthy women, body mass index was associated with short- and long-term increases in AF risk, accounting for a large proportion of AF independent of traditional risk factors. Weight control may reduce the increasing incidence of AF!

OIL SPILLS INTO GROUND AND SEA

As bad as the Horizon derrick explosion was in the Gulf of Mexico and the severe leakage of oil into the water thereafter, there are apparently chronic near-daily spills that add up to a much greater degree of pollution (39). A 2003 report from the National Academy of Sciences, which several top scientists have said remains the best estimate of oil's impact on oceans, estimated that 4 billion gallons leak into the oceans each decade from all sources, a quantity 25 times the highest estimates of the spill in the Gulf of Mexico. Apparently, scientists find it difficult to compare the damage from the routine discharges into oceans and estuaries with that of the Gulf spill because there has been so little study of the issue. There also is natural seepage of oil from under the sea. The 2003 study estimated that 293 million gallons a decade enter the waters off North America, most in the Gulf and off California. Worldwide, an estimated 1.8 billion gallons of oil seep out into the waters per decade. Thus, the amount of natural seeps is horrendous.

Although massive blowouts receive the most attention, the largest human-caused source of oil into the environment is the byproduct of millions of automobiles and other oil-powered devices! Oil that drips from a car's crankcase or gasoline that spills at a gas station eventually washes down gutters and storm drains into rivers that flow into the sea. Other significant sources include recreational boating, commercial ships and tankers, and oil production rigs. Because the government and industry do not track these spills, the totals could be much higher, the 2003 study concluded. Scientists estimate that human spills in North America alone could be as high as 6.3 billion gallons a decade.

SOLITARY CONFINEMENT

The book *The Alexis de Tocqueville Tour Exploring Democracy in America* described Alexis de Tocqueville's 9-month tour of

the USA in 1831. His alleged reason for the tour was to study the prison system in the USA and take that knowledge back to France to hopefully improve its system. He did visit a number of US prisons and found many where solitary confinement was the rule. In recent times prison officials in the USA have been reducing the number of offenders in solitary confinement—once among the fastest growing conditions of detention—as budget pressures, legal challenges, and concerns about the punishment's effectiveness mount (40). The number of prisoners in solitary confinement in the USA from 1995 to 2000 grew 40% to 80,870 segregated inmates. These inmates were typically locked away for 23 hours a day in single cells and required at least 2 guards to escort them to shower or recreation. As a consequence, placing prisoners in solitary confinement is about twice as expensive as placing prisoners in the general prison population. From 2007 to 2010, Texas reduced the number of inmates in solitary confinement from 9343 to 8627. I am certainly not a punishment expert, but solitary confinement does not seem to offer much correction of bad behavior.

ELEVEN-HOUR TENNIS MATCH

During the Wimbledon, England, Tennis Tournament in June 2010, John Isner and Nicolas Mahut played an 11-hour tennis match that included 216 service aces (41). Today's outer limits for speed of tennis serves are 150 miles per hour for men and 130 miles per hour for women. Some believe these speeds will increase another 10 mph in the very near future. But the booming serve is not the whole game by a long shot. Roger Federer, who has won a record 16 Grand Slam titles, is known for his smooth and accurate serve that is not particularly powerful. He is so quick that few players can put a serve past him. Rafael Nadal's weakest stroke is his serve, and yet he has won 7 Grand Slams with speed, a deadly forehand, and some of the sport's best service returns.

The match between Isner and Mahut brought the serve front and center. Isner, who won 70 to 68 in the fifth set, lost his serve just once in the entire match. Mahut lost his twice. Combined, they attempted 980 first serves and made 689, a startling 70%. Serve speeds have been rising for decades for both men and women. Tennis statistician Leo Levin, who collects data for IBM at the Grand Slam Tournaments, said the first 140 mph serve in men's tennis was recorded in 1997. In 2009, 15 men broke the 140 mph barrier. A woman did not reach 120 mph until 1996. Last year 13 women did. Andy Roddick holds the record—155 mph.

—WILLIAM CLIFFORD ROBERTS, MD
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