



## Cherry Garcia and the End of Socialized Medicine

*The new pharmacopoeia offers people too much knowledge and control for one-size-fits-all health care to cope with.*

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On June 19, 1987, Ben & Jerry's introduced Cherry Garcia, in honor of the man who played lead guitar for the Grateful Dead. The Food and Drug Administration struck back three months later, when it approved the first of a new family of statin drugs that curb cholesterol production in the human liver. A synthetic statin licensed a decade later would become the most lucrative drug in history. At its peak, Lipitor was streaming \$14 billion a year into Pfizer's coffers.

Let's not blame the victim: we don't choose Cherry Garcia; it chooses us. Lipitor is a lifesaver for 600,000 genetically unlucky Americans who harbor a bad-cholesterol gene or two on chromosome 19, and for another 100 million victims of our supersize-me culture. Fourteen billion dollars is a bargain for problems as pernicious as these. Or is it? Let's blame the victim. The human body is so comfortable with fat that it rarely complains about a cholesterol glut in the blood until seconds before things crash. Many who should be worried never even get their blood checked. Many who do check it fail to take their Lipitor. None of us really needs the pill anyway—just lose the ice cream, shed the pounds, stop smoking, and exercise regularly. Lipitor is a chemical version of the bulimic's finger down the throat.

Or think of it as an antibiotic for people infected with cholesterol. The first statin was isolated from fungus by a Japanese biochemist, who figured that if some microbes secrete penicillin to kill rivals, others might have devised a way to kill by crippling production of the cholesterol glue that holds enemy cells together. Like other antibiotics, statins target the chemistry of life—ours. Health once depended mainly on killing germs. Now, most drugs are used to poison people.

Call it tuning, if you prefer. Lipitor tunes our cholesterol. Anti-stroke medicines tune our platelets, antidepressants our serotonin and dopamine, heart medicines our angiotensin-converting enzymes, contraceptives our estrogen. Cancer drugs tame or kill our own mutant genes. And for every drug to suppress chemical excess, there's another to address deficits: insulin for the underperforming pancreas, clotting factors for bleedy blood, Synthroid for the tired thyroid, and cancer-suppressing proteins to lend a hand to tumor-suppressing genes.

People-tuning drugs aren't all new—aspirin, it turns out, is Lipitor for inflammatory prostaglandins—but the speed at which they are multiplying is very new. So too are the cost, complexity, and the sheer audacity of medicine's new mission: to bottle an upper or downer for every last molecule that makes us tick or gums up the works. There's still far more of this in the lab than in the pharmacy, but there's a lot out already, and it's going to keep coming.

Medicine has never seen—nor much needed—anything like this biochemical arsenal before. When infectious germs were still ubiquitous, few people lived long enough to clog their arteries with ice cream. But by 1967, a century after London launched the first systematic attack on cholera, America's war against germs was officially over and won—the surgeon general said so [see "[Germs and the City](#)," Spring 2007]. In affluent countries, most diseases now originate in human chemistry. Doctors and hospitals spend most of their time grappling with its cumulative effects. Most of our drugs are prescribed to neutralize it. Some people are still attacked by microbes, but such assaults from the outside aren't the big problem any more. The cholera of our times is a stew of specific, discrete molecules, concocted by genes, gluts of cigarettes, beer, ice cream, and other delicious consumables, and by whatever attitude problems we might have about eating our peas or taking our pills.

No two human stews are quite the same, however, and the problems that they incubate are much less evenhanded than the ones spread by sewage and sneezing neighbors. Contagion is the melting-pot disease; it homogenizes and unifies. Cholera killed a duchess as easily as a flower girl. Cholesterol and other human cholesterols are rooted in our private differences. They disassemble our health, fragment treatment, and pull us apart.

The new medicine offers instead something that the old never could: personal control. Germs are always finding new ways to infect and spread, bad luck invariably figures in who gets hit, and epidemics will forever remain surreptitious and surprising. Human chemistry is much more complex, but comparatively slow and stable. And molecule by molecule, medicine is now making it visible, predictable, and tractable. Cholesterol can be quite as lethal as cholera, but how much of it you have in your own blood this morning, and what it will do to your heart in 2017, isn't a matter of dumb luck—not any more.

This great etiological shift—from the medicine of us versus germs to the medicine of us versus us—upends everything. Disease and its cures now depend on factors too fragmented for conventional insurance pools to contain, too costly for public treasuries to underwrite, and too divisive for public authorities even to discuss, much less manage. The era of big government is over in medicine, too. Within a decade or two, a charismatic president will deliver on the promise to end health care as we know it. What then? Science will discover, competition will supply, patients will choose, and freedom will deliver better medicine and far better health, at lower cost, to many more people.

**A**sian-American women have a life expectancy of almost 87 years; African-American men, 69 years. We have these facts on the authority of *Eight Americas*, a 2006 study by number crunchers at Harvard's School of Public Health. Women in Stearns County, Minnesota, live about 22 years longer than men in southwest South Dakota, and 33 years longer than Native American men in six of that state's counties. The gap between the highest and lowest life expectancies for U.S. race-county combinations is over 35 years. Some race-sex-county groups typically die in their nineties, others in their fifties. Some are healthier than the norm in Iceland, Europe, and Japan, others sicker than Nicaragua and Uzbekistan.

Factoring out wealth, race, and access to health insurance doesn't eliminate most of these disparities. Low-income whites die four years sooner in Appalachia and the Mississippi Valley than they do farther north. The healthiest whites are low-income residents of the rural Northern Plains states. In the West, American Indians who remain on the reservation die much sooner than whites.

What accounts for these cavernous differences? Harvard dares to name six leading "risk factors" for the population as a whole—alcohol, tobacco, obesity, high blood pressure, cholesterol, and glucose—and reports that these factors correlate strongly with the spread in life expectancy across its Eight Americas. One of the study's authors ventured to suggest, albeit only in an interview, that where you live may point, in turn, to ancestry, diet, exercise, and occupation.

This is timid hash, and there are only two ways out of it. Harvard retreats into fog: we're beset by "socioeconomic," "cultural," and other "distal causes" of disease. The other alternative is to disassemble culture, lifestyle, gender, and ancestry into components as small, specific, and measurable as cholesterol. At the far end of this politically treacherous trail, the distal fog melts away in the harsh light of molecular chemistry.

**A** molecule can change your life quite as much, if not quite as quickly, as standing at the wrong end of a bullet or a speeding truck. A doctor going door to door on New York's Lower East Side in 1911 could have cured rotting gums, grotesque swelling in the legs, brittle bones, noxious skin ailments, and a thick catalog of other debilitating diseases by distributing a pill—just one—that's now cheaper than candy, and so familiar we no longer view it as medicine at all. But a century ago, these terrible diseases killed and crippled so many people—tens of thousands of Americans every year—that many doctors viewed them as infectious. They weren't. Industrial processing was stripping nutrients from the food that fed the city. Kids needed Flintstones.

The first vitamin was isolated in 1912. Others followed, and chemists soon found ways to extract or synthesize them cheaply. Prodded by private charities, medical associations, state health authorities, and federal guidelines, major food suppliers eradicated rickets, scurvy, goiter, beriberi, and pellagra, by returning to their products what they had inadvertently removed; they also improved infant health enormously by fortifying flour, milk, and salt, and promoting the consumption of cod-liver oil by pregnant women. By 1950, the Flintstoning of the American diet was routine, and the national menu was back to healthy again, or so many people thought.

They too were wrong. By 2005, seven of the world's ten most profitable drugs owed most of their success to our foolish mouths. Two of those drugs lowered cholesterol, one suppressed the blood's tendency to clot on cholesterol plaques, one lowered high blood pressure caused in part by clogged arteries, two were for heartburn and acid reflux, and one was for asthma, often aggravated by cigarettes. In Western countries, smoking still causes more deaths than all other readily preventable causes combined, but gluttony is catching up. It's now responsible for 350,000 preventable deaths in the United States every year, including about one-third of all cancers.

**C**holesterol was one of the first molecules to emerge from the disassembly of glut-and-gene statistics because it plays such a big role in gluing us together. In 1985, in their own Nobel lecture on the lipid, Michael Brown and Joseph Goldstein noted that cholesterol was "the most highly decorated small molecule in biology," with eight prior Nobels on its shelf. But however often it may party in Stockholm, cholesterol will never be as simple as cholera, because what it does depends so much on whom it's gluing. Thin families are all alike, but every fat family is unhappy in its own way.

About one in three Americans officially has fat blood—cholesterol tagged somewhere between a trifle chubby and obese. The main cause is a chubby diet, but some bodies handle their Cherry Garcia worse than others. About two people in 1,000 are born with a bad-cholesterol gene. Their livers can't handle cholesterol as well as their mouths can, and they're 20 times more likely to suffer a heart attack before 60. About one in a million is born with two copies of the gene, and the heart attacks then begin in childhood. About one person in two of European ancestry is born with a bad-heart gene, which boosts the risk of heart disease by 15 to 20 percent. About one in five is born with two copies, which more than doubles the risk.

Similar muddles of gluts and genes now underlie most of what ails us. The first patient we meet in Sherwin Nuland's *How We Die* is a powerfully built construction-industry executive whose business success had "seduced him into patterns of living we now know are suicidal," back when "smoking, red meat, and great slabs of bacon, butter, and belly were thought to be the risk-free rewards of achievement." The patient has been admitted to the hospital complaining of chest pain, but he seems fine and is resting comfortably. And he's just seconds away from the violent heart attack that will kill him.

Genes are the other big part of the story, as they quite possibly were with Nuland's unhealthy executive. At least 3,000 distinct genetic links to disease are already known or suspected—for heart disease and diabetes; for breast, colon, kidney, prostate, and dozens of other cancers; for arthritis, Alzheimer's, cystic fibrosis, Parkinson's, and Huntington's disease; and for porphyria, the nervous-system disorder thought to have afflicted King George III. Nuland's brother and one of his parents both died of colon cancer. "The best assurance of longevity," he notes, "is to choose the right father and mother."

**N**o such rumination about personal frailties was required when the authorities opened London's assault on cholera in the mid-nineteenth century. To be as infectious as they are, germs must use public transit—the common water or air, most typically—and they must target common human chemistry—the bacterial peg must fit neatly into some chemical hole that most of us share.

The difference between medicine's old simplicity and its new complexity is rooted in molecular biology. A typical bacterium has a few thousand genes; a typical virus, just a dozen or so. These small numbers keep the biochemistry of infectious disease and its antidotes relatively simple. New York today has a population of 8 million, each resident of the city has

about 25,000 different genes, and no two residents are configured quite the same. And the germ of a biochemically unique disease may lurk in any one flawed gene, or combination of antagonistic genes, or confluence of genes and lifestyle.

By scrutinizing differences in our chemistry, biochemists can now disassemble glut-and-gene diseases into molecules that can be exposed long before they morph into plaques, clots, tremors, tumors, occluded airways, clogged arteries, and failed muscles. Breast cancer used to be a lump; now it's at least four genes, two of which, when paired, make a tumor almost certain. Alzheimer's disease has been linked to four genes. Autism may result from glitches spread across 100 or more. Fats, proteins, enzymes, antigens, and hormones adrift in our bodies presage problems that lie so far in the future that conventional medicine does not yet see any "disease" at all; they can also flag the seeds of disease already planted but still too tiny to discern with any conventional diagnostic tools. Perilous-lifestyle genes control hormone levels, brain chemistry, nerve functions, and metabolic rates, which in turn influence stress, pleasure, irritability, aggression, impulsive behavior, suicidal tendencies, alcoholism, and sexual appetites. The Y chromosome seems especially toxic—men are far more self-destructive than women.

Conditioned to celebrate our differences, we still find it very difficult to discuss suicidal lifestyles and flawed genes. But the relentless advance of molecular science is outing them all, regardless. Medicine's principal mission today is to provide antidotes to the unhealthy side of human diversity, diversity defined by our own fissiparous chemistry.

**B**ecause they treat our differences, not what we share, the new drugs cost far more than the old. Brewing huge vats of penicillin or Lipitor is quite cheap. The expensive part—\$1 billion or so per drug—is discovering the recipe and selling it to regulators, insurers, doctors, and patients. Most of that billion is spent before the first pill is sold; the per-patient cost depends largely on how many people the pill then treats. One vaccine, administered to many of the healthy, can protect the whole planet. Lipitor, by contrast, treats a few million Americans. Gleevec was first licensed to treat 40,000 patients with the "Philadelphia chromosome," which causes a rare form of leukemia. A disease with four separate genetic roots probably requires four miracle drugs on the shelf. "Pharmacogenomics" fragments things further still, by tailoring drugs to patient-specific genes.

From here on out, cost—rather than any shortage of targets or biochemical know-how—will determine how fast drug companies develop and license new antidotes to human chemistry.

The molecule spies have handed drug labs a gigantic stack of blueprints; all the rest comes down to dogged, though stupendously expensive, chemical, medical, and legal engineering. There were only a few dozen vaccines and antibiotics in the field when the authorities declared the war on germs pretty much won. There will be thousands of people tuners in the arsenal before anyone is rash enough to announce that we have human chemistry fully under control.

And the announcement will still come too soon. Molecular medicine can also deliver thinner thighs, broader shoulders, fewer wrinkles, choreographed pregnancies, designer babies, better hair, sex, and sleep, and whatever else the incorrigible mountain biker may crave. Biochemists have already identified one "grim reaper" gene, and several "fountain of youth" genes, which point the way to lots more beyond-perfect pills. "The first person to live to be 1,000 years old is certainly alive today," declares Aubrey de Grey, a Cambridge University geneticist. "I am working on immortality," says Michael Rose, a professor of evolutionary biology at the University of California, Irvine.

Finishing the job could take time—the science and medicine of fragments won't soon coalesce into a clear picture of how all the bits and pieces interact. But medicine does now have a deep, biochemical logic that sharply separates it from its past. Killer gluts and genes are much more complicated than killer germs, but the new pharmacology surpasses the old by an even wider margin. And the new medicine doesn't have to get us all the way to eternity to transform the economics and politics of health care beyond recognition.

**M**ost fundamentally, molecular medicine puts the patient in control. It tells him where his personal gluts and genes will probably take him years from now, and exactly how to dodge destiny by downing less ice cream or more Lipitor. The patient with this much personal control in easy reach will also, at some point, come to be viewed as responsible for failing to do the right thing.

Molecular medicine's most important revelation suggests a very modest prescription: some things are best kept out of our lungs, guts, blood, and chromosomes. This, of course, is why we have rules to keep mold, dead insects, smoke, asbestos, benzene, radiation, and more out of food, workplaces, water, and air. Many individuals are now at least equally careful about what they eat, drink, and inhale, and some go so far as to tinker with genes. If each parent harbors a bad-cholesterol gene, a couple faces a one-in-four risk of bearing a child who will have a disastrous cholesterol problem. A routine test early in pregnancy lets the parents find out, and then redeal their genetic cards, if they wish to. Most people, however, still prefer to take their genetic chances with offspring, and many still line up for a daily fix of fat, nicotine, tar, alcohol, salt, or cocaine.

That so many tests and pills can now help keep our chemistry in balance amplifies these differences. Health-careless people tend to be as casual with pills as they are with dessert. Lipitor only widens the gap between people who generally live informed, disciplined lives, and those who don't.

Lifestyles certainly can change for the better. Harvard reports that Native Americans who leave the reservation soon become much healthier. And shining a harsh diagnostic light on bad habits does help nudge people in the right direction. But for the most part, suicidal lifestyles have proved stubbornly resistant to change. It took decades to curb smoking. Cholesterol's perils have been understood for at least as long as tobacco's, but we actually need it, suppliers are everywhere, they can't all be taxed and harried as the handful of big tobacco companies were, and diets are getting worse.

Much about the way genes move and lifestyles develop seems to keep health stuck in its rut, for better or worse. Asian-Americans, Harvard reports, somehow pass on their longevity to their kids; Ben & Jerry's has apparently failed to corrupt them. Genes tend to travel in packs, too, because people tend to look for mates much like themselves. Whatever the reasons, the health lines separating Harvard's Eight Americas have persisted for generations.

**I**n the One America vision of things, better government would deliver better diets and also more Lipitor to all, and that would make health care, perhaps even health itself, equitable and uniform. But however clear a health problem may be, and however simple and cheap the cure, molecular medicine is riddled with lines that the nanny state just can't cross. Who would ever have thought, for example, that the pursuit of thinner thighs might cause 1,000 birth defects a year, many as dreadful as thalidomide's—and do it in the teeth of a federal scheme to save children from those very afflictions?

In 1998, the Food and Drug Administration resolved to slip a certain drug into everyone's food. Dr. David Kessler, the FDA's head at the time, preferred to call it a "pharmacologically active ingredient," but what's the difference? Folic acid (vitamin B<sub>9</sub>) promotes normal embryonic growth quite as powerfully as thalidomide inhibits it—a healthy dose keeps a baby's spinal cord inside his spine, saving him from a lifetime in a wheelchair. The unborn baby needs a full ration in the first six weeks after conception, however, and roughly a quarter of young women have diets that fall short. So in 1998, Dr. K. directed that a modest dose be added to almost all flour, cornmeal, pasta, and rice flaked as "enriched."

Doctors of jurisprudence, however, have concluded that no one can force an expectant mother to eat her risotto, least of all for the benefit of what may be growing in her womb. And on the advice of low-carb guru Dr. Atkins, millions of fertile young women stopped eating at Kessler's diner shortly after he adopted his stealth-health menu. The late 1990s' dramatic decline in "neural tube" birth defects began leveling off in 2004. The public cure for a nutritional deficiency reached its limit, apparently, in a private cure for gluttony.

The spina bifida baby isn't responsible for his fate, but his mother certainly is in charge of hers—the Supreme Court says so. And many people, it seems, are reasonably comfortable inside their own skin, warts and all, don't wish to change or medicate their lifestyles, and recoil at the thought of trying to jigger their children's genes. Stealth-health medicine worked brilliantly in the war against contagious germs—by stemming contagion, vaccines and antibiotics protect the unvaccinated, too—but it can hardly touch gluts and genes. Freedom includes the freedom to burn your candle at both ends, though it will not last the night.

So what will insurers do with the pill that leaves the kick in a pack of Marlboros but magically neutralizes the poison? Will Aetna and the surgeon general both celebrate this miracle drug, congratulate Pfizer for racking up \$40 billion in new sales in just one year, gracefully accept their respective shares of the bill, and watch calmly as smoking rates ramp back up? Will Congress declare that every smoker needs this drug, every smoker must get it, and Pfizer's price gouging must end at once? Or will some heartless bookkeeper in Hartford or Washington dare to suggest that enough is enough, smoking is foolish, and the smoker can jolly well pay for the pill himself—or, failing that, for his own cancer, emphysema, and heart disease?

Lipitor for the Marlboro Man will take a while, but molecular medicine already raises questions like these every day, and they will keep piling up until they can no longer be concealed in the fine print of insurance policies or federal regulations. Common as they still are, insurance systems that pool health risks indiscriminately are vestiges of the past. They can't survive what lies ahead.

Insurance makes sense for risks that people can't control. Or to put it more bluntly, socialized medicine was a smart idea back when medicine was too stupid to halt infectious epidemics, discourage suicidal lifestyles, or discern the perils in killer genes. Berlin established national health coverage in 1883, soon after Robert Koch identified the bacterial cause of tuberculosis. When your neighbor has TB you're happy to buy him a trip to a hospital, preferably in Aruba. Britain's National Health Service was created in 1948, just as a cure—streptomycin—was becoming widely available. The antibiotic was cheaper than Aruba, and more effective, too. Washington began subsidizing a large chunk of U.S. health care five years earlier, when the IRS ruled that health benefits supplied by employers weren't taxable income for employees. The poisonous effects of tobacco and diet weren't nailed down until well into the 1950s. A systematic science for isolating and addressing perilous genes has emerged only in the last decade.

But we're now past the days when infectious diseases were the dominant killers, and heart attacks and lung cancer seemed to strike as randomly as germs. And insurance looks altogether different when your neighbor's problem is a persistent failure to take care of himself. Many people willing to share the burden of bad luck eventually tire of sharing the cost of bad behavior.

The new medicine certainly hasn't banished luck completely—molecules don't predict car accidents and can't yet cure Huntington's disease, cystic fibrosis, or many rare cancers. A widely shared sense of common decency also impels protection of children and the elderly. In between, however, the unifying interest in health insurance is surely the sense that anyone can be struck out of the blue by a ruinously expensive health catastrophe. And step by relentless step, molecular medicine is taking luck out of the picture.

Now consider what that does to insurance economics. Most critics of the status quo focus on the more manageable of the two core problems that health insurers now face: runaway cost. But the real problem is that for many people, health care is getting *cheaper*. This is what makes actuaries wake up screaming in the night: disease is coming out of the closet, and the new medicine splits health-care economics in two. For the health conscious, skipping the Cherry Garcia may be difficult, but it's cheap, and Lipitor at almost any price is much cheaper than a heart attack. The health careless skip only the pill, not the ice cream, and end up in desperate need of what helps the least and costs the most. Doctors, hospitals, and scalpels summoned late in the day cost far more, and accomplish far less, than chemistry tuned to the point where there's never plaque to cut.

No one-size, one-price insurance scheme can keep people happy forever on both sides of this ever-widening divide. Aetna can't offer uniform coverage to individuals who face radically different risks, and who know it, too. Governments can't, either.

**F**or now, public authorities and private insurers conceal the growing cracks with Silly Putty definitions of what they'll pay for. The old medicine of scalpels and human services is quietly but strictly rationed, if not by ability to pay, then by making patients wait in ever-lengthening lines for access to overworked doctors, obsolescent labs, and deteriorating hospitals. The new medicine winds up rationed by slow-rolling many new pills.

Britain, with one of the world's worst cholesterol problems, began prescribing statins years late, and much less aggressively than it should have. Nine years after the first statin had been licensed in the United States, Britain's National Health Service was still grappling with the fact that it couldn't afford the drugs, and its doctors were prescribing statins to only a small fraction of the people needing them. U.S. insurers, both public and private, often do much the same thing. They extend coverage to new medicines well after they're licensed, limit aggressive prescription early on, cover drugs sold in pharmacies much less generously than those administered in hospitals, and jigger deductibles and co-payments. The gap between what's covered and what the new medicine can treat grows steadily wider.

As they line up in emergency rooms, the health careless will never know what they're missing. But the health conscious will find out that they are paying for yesterday's medicine, which they don't need any more, and not getting tomorrow's, which they do. Then, inevitably, they will look for coverage tailored to their own responsible behavior.

If they were allowed to, private insurers would respond with policies openly tailored to molecular profiles and priced accordingly. Insurers already do quite a lot of that kind of tailoring indirectly, by insuring through employers—work often segments insurance pools along lines similar to those flagged by Harvard. Any private insurer that fails to push this kind of segmentation as far as it can will end up covering all the heart attacks, while competitors underwrite the low-fat or high-Lipitor diets.

**G**overnments don't face the risks of competition, so they can insure as indiscriminately as taxpayers will allow. Or to similar effect, they can—and do—require private insurers to sell only one-size policies at one-size prices. Private insurers don't openly tie coverage to personal chemistry because a slew of laws protect pri-vacy, mandate equal treatment, and bar discrimination on the basis of sex, race, disability, pregnancy, age, obesity, and much else. But however it's packaged and peddled, universal health insurance requires steadfast public support—and the political center just won't hold.

First, you have the pedestrian problem of costs that rise forever. The passive, clueless, and feckless must get ruinously expensive, last-ditch care because they don't show up until it's too late for anything else, and universal means what it says. The informed and engaged will stay healthy enough to demand better hair, skin, and sex along with their Lipitor. And while this is less frantic, desperate medicine, with a quite different price tag, its costs will keep rising, too, for as long as new lifestyles offer new ways to delight our bodies and medicine offers new antidotes to help us survive the pleasure. Vaccines and antibiotics kill their own market by wiping out all the germs. Lipitor just keeps the customer alive to crave more Cherry Garcia.

Then there's the merciless fact of global competition. The cost of health care has a big, direct impact on both the cost of labor and the marginal tax rate. If California defies the new medicine's economics by requiring insurers to ignore everything but age and geography, firms can flee to Texas, Ireland, or Shanghai. Efficient labor markets require efficient health insurance, which will be found only where actuaries are allowed to find out as much as the rest of us can, and craft policies accordingly.

A third, deeper problem is (depending on your politics) either base selfishness or common sense. The pocketbook-healthy eventually tired of paying for welfare that persistently failed to end poverty; the health-healthy will tire of paying for health

care that persistently fails to improve health. However selfless and generous people may be, responsible types eventually despair of trying to cure self-destructive behavior from a distance.

Finally, the new medicine is too hot for even the political Right to handle, and the Left can hardly even acknowledge what it's all about. To pick just one politically insoluble example among many, scientists have already isolated chemical and genetic links to mental retardation. In due course, they will develop drugs to improve or compensate for genes that help shape intelligence. Then someone will have to decide whether mental acuity, say, is as important as cystic fibrosis, and if so, where insurers must set the IQ cutoff for coverage. Medicaid will have to set a federal line, and Virginia can perhaps establish a benchmark for the states.

Virginia has experience. In 1927, its medical authorities sought to sterilize Carrie Buck, a teenager they deemed a "mental defective." "Three generations of imbeciles are enough," declared Justice Holmes, in the Supreme Court's ruling that they could go right ahead. If the follow-up case returns to the high court in 2027, the question will be whether eugenics in a bottle is a right so fundamental that Virginia must pay for it.

**A**ll of us depend on the same short list of basic nutrients—a few dozen vitamins, minerals, amino acids, and raw calories. Cherry Garcia alone, as it happens, pretty much covers it. Or we can thrive for years on nothing fancier than mother's milk, which lacks even the cherries—many of us once did. This simplicity made deficiency diseases quite easy to beat, once science revealed what was missing. So easy that many people are surprised to learn that vitamin science earned a fistful of Nobel Prizes in its day, and that vitamins were very expensive before they became so cheap.

In the early 1920s, Quaker Oats offered \$900,000 to buy a new method to enrich the vitamin D content of food. Sensing an opportunity to peddle health and pleasure in a single package, cigarette and beer companies also wanted the patent. The inventor, Professor Harry Steenbock of the University of Wisconsin, opted instead to set up an independent foundation to license the technology and return the proceeds to his lab. Ten years later, the foundation had earned more than \$17 million on the patents—and rickets had almost disappeared from the United States.

Much as vitamin deficiencies did back then, chronic obesity now destroys joints, breaks bones, swells body tissues, and causes heart disease. For one exhilarating decade, Pfizer made a fortune suppressing just one molecule in the long, toxic list of things we shouldn't consume but often do. Then statin patents began to expire. On June 22, 2006, Merck still owned a statin, Zocor, that earned the company over \$3 billion a year in the United States alone. The next day, the formula belonged to humanity.

Lipitor, though introduced later, had quickly eclipsed Zocor in the market, and its patent still had five years to run. But Zocor was now set to take a Pyrrhic revenge. U.S. insurers immediately began jiggering co-pay schedules to migrate patients to generic versions of Zocor. *Consumer Reports* estimated that a wholesale shift would save \$7 billion to \$11 billion a year. Lipitor's market share dropped 4 percentage points in the first half of 2006. Wall Street saw it coming: a few months earlier, Pfizer's stock price had hit an eight-year low, almost 50 percent below its Lipitor peak. Zocor still sold at about \$3 a pill in early 2006; generic copies now sell for as little as 50 cents.

Statins end up very cheap for much the same reason that cholesterol did: there are huge economies of scale in farming cows for milk and fungi for statins, or in brewing up synthetic versions of almost anything. But it takes a delicate choreography of patent-protected monopoly and cutthroat competition to get the innovation first and the rock-bottom prices later. At present, the front end is financed mainly by the United States. Drug companies introduce most new drugs here first, and affluent Americans pay premium prices while the patents last. Less affluent Americans, along with public and private insurers in the United States, Britain, Canada, and the rest of the developed world, get a sharply discounted ride on their economic coattails. Three-dollar statins in New York in 1996 get 30-cent statins to London in 2006 and three-cent statins to Kuala Lumpur a few years later.

Governments are impatient, however, especially when they have promised to supply what they can't possibly afford but can readily seize. The promise of universal care implies state-of-the-art care, so governments' principal response has been to skip straight to the three-cent pill. In the developing world, the authorities just fail to notice when pirates manufacture knockoffs. Most developed countries have gone halfway there, by instituting a monopoly buyer to bargain against the monopoly patent. Some members of Congress want to let U.S. patients order drugs from Canadian pharmacies, so that Ottawa will bargain with Pfizer on behalf of the poor in Oshkosh. Others want to set Washington up as the monopoly buying agent for all drugs that it pays for.

Drug companies, however, are quite smart enough not to develop three-dollar pills for three-cent buyers. Collectively, these price-depressing strategies already make it unprofitable to pursue many drugs that treat rare diseases, and drugs for all but the most common diseases earn most of their profit in the unregulated U.S. market. From Big Pharma's perspective, we are now about half a country away—the rich-America half—from making most diseases too thrifty to bother with. Wherever it's implemented, every new scheme to undercut the value of an existing patent lowers the incentive to discover new drugs. Every such scheme sacrifices long-term global health for short-term political gain. Every last one of them is ice cream today, and never mind about tomorrow.

*That* is the real crisis in health care—not medicine that's too expensive for the poor but medicine that's too expensive for the rich, too expensive ever to get to market at all. Human-ity is still waiting for countless more Lipitors to treat incurable cancers, Alzheimer's, arthritis, cystic fibrosis, multiple sclerosis, Parkinson's, and a heartbreakingly long list of other dreadful but less common afflictions. Each new billion-dollar Lipitor will be delivered—if at all—by the lure of a multibillion-dollar patent. The only way to get three-cent pills to the poor is first to sell three-dollar pills to the rich.

With almost \$30 trillion under management, Wall Street could easily double the couple of trillion it currently has invested in molecular medicine. The fastest way for Washington to deliver more health, more cheaply, to more people would be to unleash that capital by reaffirming patents and stepping out of the way.

On the other side of the pill, molecular medicine can only be propelled by the informed, disciplined consumer. Any scheme to weaken his role will end up doing more harm than good. Foggy promises of one-size, universal care maintain the illusion that the authorities will take good care of everyone. They reaffirm the obsolete and false view that health care begins somewhere out there, not somewhere in here.

Neither Pfizer nor Washington can ever stuff health itself into a one-price, uniform, One America box—not when health is as personal as ice cream, genes, and pregnancy, not when every mother controls her personal consumption of carbs, cholesterol, Flintstones, and Lipitor. But the thought that government authority can get more bodies in better chemical balance than free markets and free people is more preposterous than anything found in *Das Kapital*. Freedom is now pursuing a pharmacopoeia as varied, ingenious, complex, flexible, fecund, and personal as life itself, and the pursuit will continue for as long as lifestyles change and marriages mix and match. Given time, efficient markets will deliver a glut of cheap Lipitor for every glut of cheap cholesterol. And given time, free people will find their way to a better mix.

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