HEALTH

The end of illness?

A 'rock star' doctor says throw away the vitamins, load up on baby Aspirin, and keep moving. **By Brian Bethune.**

TAKE STATINS IF you're over 50, and baby Aspirin, too. Drop the vitamin supplements like they were a lit cigarette. Junk the juicer. If the vegetables at the supermarket aren't today-fresh, opt for fresh frozen. Wear sensible shoes. Eat lunch and go to bed at the same time every day. Get your flu shot. Move around a lot, even when you aren't exercising. Digitize your medical records, family history and genetic profile, and store this information on a USB stick. Carry it with you always. Share it, anonymously, with the world.

Think of yourself as a system: cancer is not something the body gets and health is not something it has—both are states, dynamic processes really, that the body undergoes. And your system is not the same as anyone else's: the daily glass of red wine that does wonders for your friend may be killing you. Take note of the specific, unchanging details of your system. Is your ring finger longer than your index finger? That ups the risk of prostate cancer for a man, and of osteoarthritis for a woman. (No one knows quite why, but the marker is well-established.) Keep an eye on your more changeable fine points. Check your nails: yellowish hue bad (go for a diabetes check); white crescent at the base good (iron levels are sufficient). Check your ankles: indentation marks from your socks or loss of hair could mean circulatory problems and increased risk of blood clot.

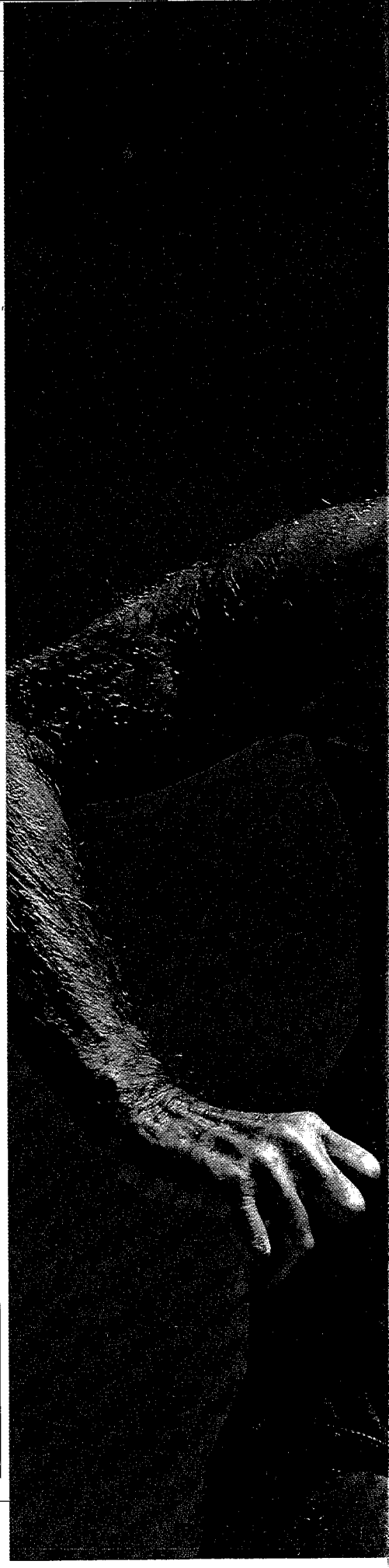
Do all these things, which essentially add up to two commandments—cut down on daily sources of life-threatening inflammation and take an active part in your own health care—and you stand a very good chance of living to see the end of illness.

So argues Dr. David Agus in *The End of Illness*, a passionate and provocative assault on the rut in which he believes modern medicine is stuck, especially his own speciality, oncology. It's been almost a century since deadly infectious disease was pushed into the background of the West's mortality tables. Yet while deaths from the leading chronic killer, heart disease, have declined by 60 per cent in the developed world since 1950, the cancer death rate has barely budged.

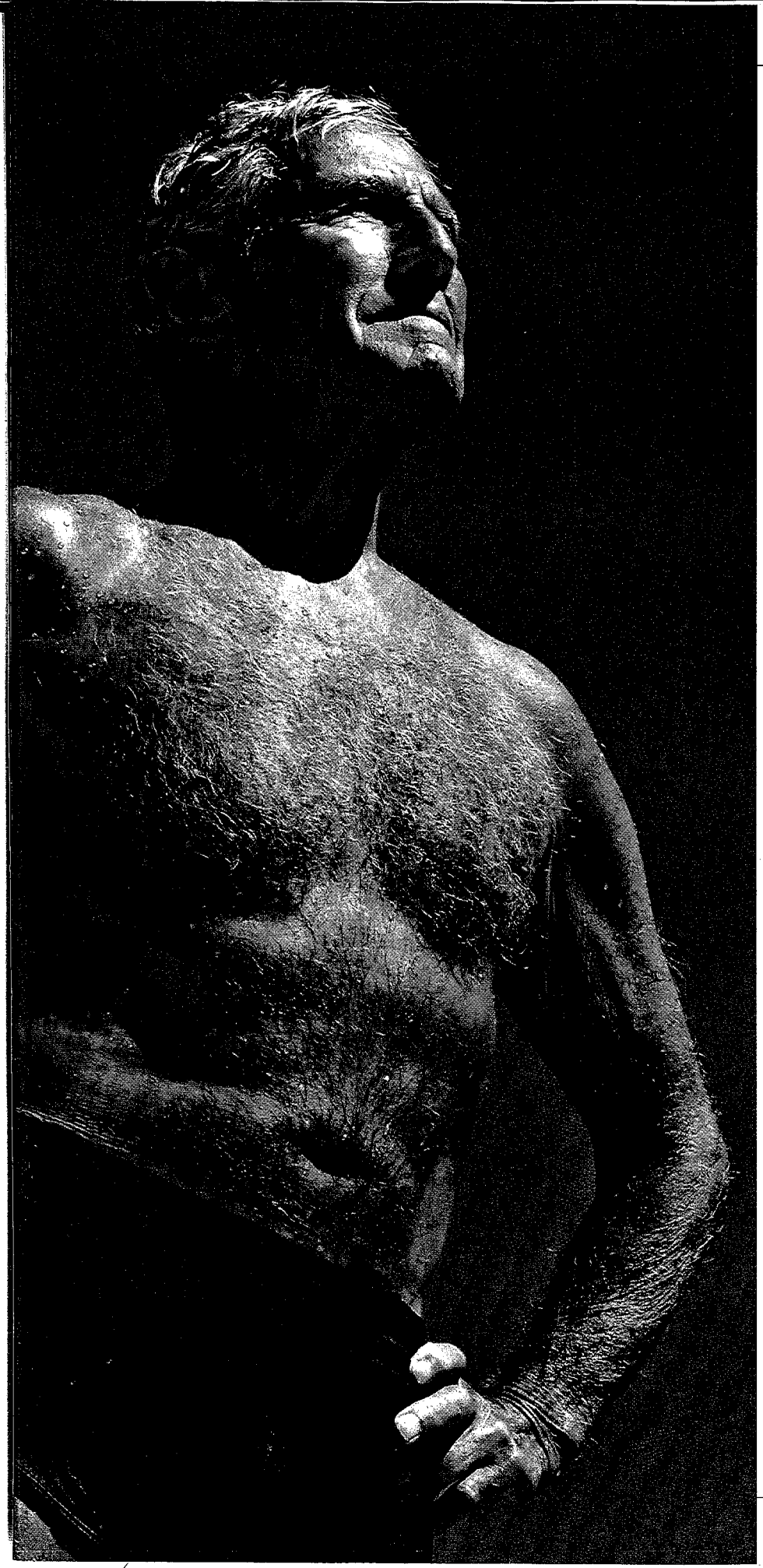
Agus, 46, has the credentials to demand a hearing. He's a professor of medicine and engineering at the University of Southern California, the 2009 GQ "rock star of science," founder of two personalized medicine companies and a man who "looks at death two or three times a week," as he sombrely notes in an interview. "Every week I tell people, 'I'm sorry, I have no more drugs to try on you.' I don't want to do that anymore. It's killing them, and it's killing me."

We need to admit our mistakes and radically reorient ourselves, Agus says. In chorus with a growing number of chronic disease specialists, Agus thinks it's time to forget the lessons erroneously drawn from the victorious war against infectious diseases, time to realize chronic illness is different. It is not discrete parts that can be targeted with drugs or surgery like a colony of alien bacteria, but the whole system. Cancer is a verb, he repeatedly and strikingly stresses: the body of a leukemia patient is "cancering."

And with most types of cancer, we are scarcely likely to win a war, not if victory is defined as a complete cure. But if we look at the body as a system, with a few simple lifestyle changes, plus new technologies already in the pipeline, three inexpensive medicines,



Doctor's orders: *In his new book, a U.S. oncologist says keeping inflammation at bay is the key to living a long and healthy life*



and a change in the way we store and share medical information, we can achieve a different sort of victory: prevention, delay, control. The end of cancer, the end of all illness, Agus says, is in sight.

FOR ALL HIS faith in technological fixes coming down the road, Agus's present-day advice has a decidedly old-fashioned feel. And with good reason: "Because that's where the data is." Agus is a fierce critic of shoddy and misleading medical tests, ones that are too observational (not controlling for variables and allowing bias to creep in) or too short in the time span covered or involving too few subjects. But there's no debating the studies, many involving thousands of participants, that demonstrate the deadly effects of simply sitting around.

For example, a 13-year study showed that sitting four hours in a row doubles your risk of dying from or being hospitalized for heart disease later in life, even if you regularly exercise, and almost surely elevates the risk of cancer as well. All told, sitting is almost as deadly as smoking. Agus, surprised to find after measuring his daily steps that he moved around his office far less than he thought, now conducts all telephone calls while walking.

Inflammation is the danger embedded in prolonged sitting, and the killer risk factor that lies behind Agus's advice. As far as wearing sensible shoes, Agus would not be surprised to hear that wearing high heels lops years off a woman's life since they are known stressors of leg joints and the lower back. Stress means inflammation, and chronic inflammation kills, probably by slowing or blocking the body's DNA repair processes. It has been linked to cancer, heart attacks, Alzheimer's, diabetes and accelerated aging. The more of it you avoid, the better your long-term prospects.

Hence the comfortable shoes and the regular sleeping hours. The human body craves predictability, and stresses out when its daily rhythms are upset. Going to bed and rising at the same times every day is possibly more important than the amount of sleep you get. Avoid naps, unless, of course, you already have a well-established nap habit. And stick to your schedule every day: no sleeping in on weekends.

Likewise, eat at the same time as much as possible. If you have to work through lunch, try to have a snack at the accustomed hour. Something healthy, which means—in conscious echo of Michael Pollan's *In Defense of Food*—"as unprocessed as possible; not too much; mostly plants." Agus has a deep sus-

picion of the obvious targets (french fries, say), but also of foods and food processing that can plausibly claim to be healthy. Juicing, for instance: "Does your body really want 10 carrots at once?" he asks. Or of supposedly fresh produce that has travelled hundreds of kilometres, leaking its nutrients all the way; better to eat fresh-frozen produce. It's vital to get your nutrients from the real thing, because for those who think they can make up any dietary deficiency by taking vitamins, Agus has some very bad news.

Vitamin supplements would be bad enough if they were merely useless, he says. The money Americans spend yearly on vitamins—some $25 billion—is sorely needed elsewhere in the medical system. They aren't getting much for their money now. Consider claims that vitamin D significantly cuts cancer risks and that three-quarters of the U.S. population had insufficient levels of it. For Agus, these results are found in not very high-grade studies; for one thing, he's at a loss to understand how anyone can claim to have established the correct dose for appropriate D levels. The bone disease rickets is long gone and age-related fractures are not on the rise, meaning that by the only indications we have, the population has quite enough vitamin D. Moreover, some of the miracle stories record what he considers absurdities, one even declaring that vitamin D cream rubbed on tumours can "make them vanish," which ignores the general fact that the human body reacts differently than lab-grown tumours and that actual tumours in actual patients are difficult to reach with a salve.

'THERE ARE NO SHORTCUTS TO HEALTH AND NUTRITION, EXCEPT THE ONES THAT SHORTCUT YOUR LIFE'

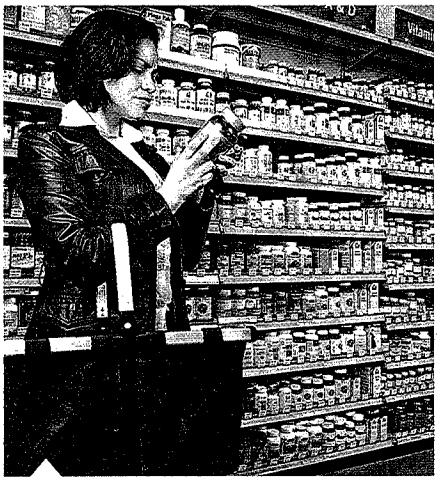
Lost in the buzz created by such stories are the results of tests that far better reflect Agus's gold standard—double-blind, placebo-controlled—one of which concluded elderly women taking D supplements had an increased risk of falls and consequent fractures, and another that found the vitamin had a potentially negative effect on prostate cancer. If our bones are doing well, Agus asks, why add more to a complex system when we don't really know what it's doing? Vitamin D feeds healthy cells, so it may also feed cancerous ones. Vitamin C certainly does. Tumours, Agus says, "eat it like candy." And while vitamin C does indeed attack free radicals, a key villain in inflammation, that's not always a good thing. The body makes free radicals for a reason (the immune system uses them for killing invading bacteria) and has its own ways of keeping them in check (a store of neutralizing enzymes). When we take supplements that excise an undue number of them, Agus says we are upsetting a delicate balancing act to ends we cannot predict.

Some of the new evidence on vitamin supplements pushes the conclusion from useless to very dangerous. A 2003 meta-analysis that looked at 82,000 patients in total found vitamin E use inconsequential and beta-carotene (a precursor of vitamin A and a common element in over-the-counter supplements) to be deadly enough in prompting heart attacks that the researchers suggested it no longer be studied because of the risks to participants. A major Finnish study found that for the five to eight years patients took the supplements and eight years afterwards, the vitamin A precursor upped lung cancer incidence by 18 per cent. The vitamin E had no effect on lung cancer, although it cut prostate cancer (by 32 per cent), albeit at the cost of a 50 per cent spike in hemorrhagic stroke (bleeding in the brain). "Death is a pretty serious side effect, don't you think?" sums up an exasperated Agus.

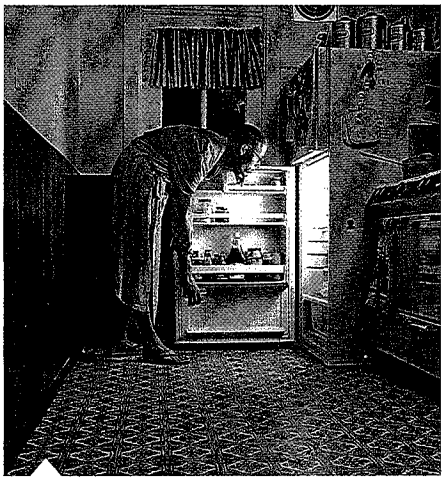
Unless you are correcting a real deficiency or are pregnant, ditch the supplements: "I've had more push-back on what I have to say about vitamins than on anything else I argue, including heated conversations at dinner parties with people who have whole shelves of multivitamins. But there are no shortcuts to nutrition and health, except ones that might shortcut your life."

Agus's book, which published this week to massive U.S. media coverage, is likely to shake up not just vitamin champions (and manufacturers) but his own colleagues. When he stood before thousands of doctors at a meeting of the American Association for Cancer Research in 2009, and uttered *The End of Illness*'s core theme—"We've made a mistake"—the "hisses that I heard leaking from the audience were disheartening."

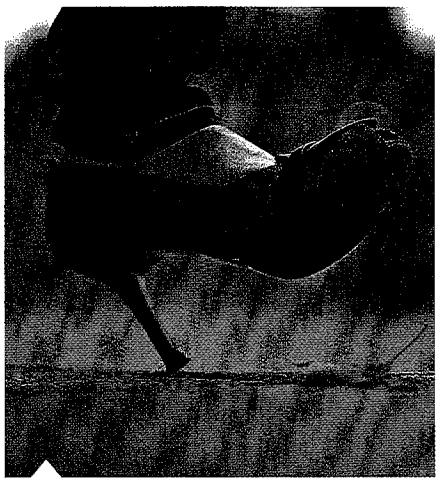
Once you have done what you can do in your lifestyle, and changed the five things that are reducing your lifespan, Agus thinks the battle to reduce chronic inflammation should move to your physician's office and to the three medicines he believes all middle-aged people should consider. Like neurobiologist Paul Patterson, who has studied the links between children in utero and later diagnoses of autism, schizophrenia and depression, Agus says people take the flu too lightly. In his 2011 book *Infectious Behavior*,



Vanquish vitamins: *Tumours eat C like candy and there is little evidence we are deficient in D*



Eat on schedule: *Try to eat fresh, unprocessed food, mostly plants, at the same time every day*



Heave the heels: *High heels stress the joints and back, and stress causes inflammation*

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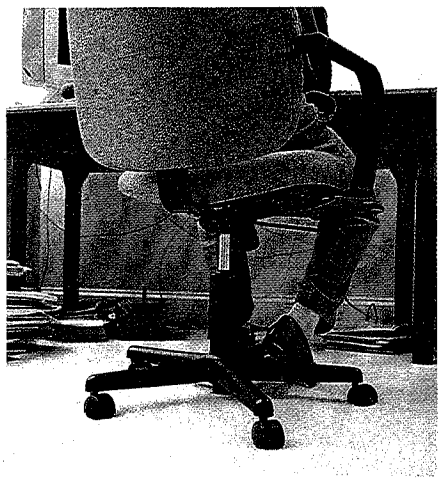
Patterson recorded the final health effects from the great flu pandemic of 1918, which killed more people than the Great War. Those who were in their mothers' wombs during the pandemic went on to lifetimes of health problems disproportionately worse than those born before or after, including higher rates of diabetes and heart disease—the effects on fetal brains of the mother's immune system ramping up to fight influenza. Agus too emphasizes the ferocity of the immune system's response to influenza, reacting "like an irrational personality that blows everything out of proportion, and producing staggering amounts of inflammation." Every bout of flu leaves "ghostly marks," aging your blood vessels and leaving you vulnerable to all kinds of inflammation-induced diseases later in life.



Move or die: *Sitting down all day is almost as dangerous as smoking, even if you exercise*

Get good sleep: *The body craves regularity, so go to bed and rise at the same time each day*

So take the vaccine, and if you won't do that, at least adopt common-sense hygiene: wash your hands and avoid airplane flights if at all possible. The stakes are higher than you thought.

More important than any vaccine, he says, is baby Aspirin, famous for helping to prevent blood clots and thereby staving off heart attacks and strokes, and now revealed to be far more of a panacea than previously thought. Last year British scientists, looking at eight long-term studies involving 25,000 participants, found that 75 mg a day reduces the risk of dying from common cancers by 10 to 60 per cent. And how does Aspirin do that? It's a powerful anti-inflammatory. Until very recently, baby Aspirin offered a trade-off for physicians and patients—blood-thinning benefits (anti-clot action) versus blood-thinning disadvantages (bleeding). Agus thinks the balance has now tipped decidedly in favour of the benefits.

Then there are statins, which the skeptical oncologist hails as the major wonder drug of our time. Statins like Lipitor and Crestor have dramatically reduced the ravages of cardiovascular disease over the last two decades. They were designed to do so by inhibiting a liver enzyme that plays a key role in producing cholesterol, the bad kind that clogs arteries. But study after study has shown that cholesterol reduction is not the only beneficial result and perhaps not even the most important. They reduce heart attacks even in people without high cholesterol, because they too reduce inflammation. They also shrink your risk of death from respiratory illnesses and infections, even long after you've stopped statin therapy, in a multi-year "legacy effect." Statins are one of the few drugs that will keep you off a ventilator if you ever come down with swine flu. If you are approaching 50 and not on statins, Agus advises, ask your doctor why.

The system-wide effects of statins is a key factor that led to one of Agus's most arresting conclusions: we probably already have all the drugs we will ever need. "I know that's a little provocative," he allows. "But I firmly believe it. Look at the drugs we have now. We can hit every major system in the body. What we don't know is the dose and the timing and the particulars of individual bodies."

Agus's frustration with this state of affairs, the single greatest roadblock to his illness-free world, is palpable: he's clearly walking faster as he discusses it over the telephone. There are terabytes of medical knowledge out there, but it is not combined or organized. "A patient goes to a doctor who sends him to a specialist, with a side trip to a technician, and there's hardly any communication between them. Sometimes we can't communicate. We don't even have standard nomenclature—what one doctor calls a "fractured" leg another calls a "broken" leg, and they don't end up in the same data collection."

There are magic bullets on the horizon, but without data they can't fire. In 2009, Agus and Danny Hillis—a former Disney engineer who pioneered the development of so-called parallel supercomputers—set up a way to measure 100,000 different types of proteins from a single drop of blood. The goal is to evaluate and make sense of the body's intricate inner workings in a way that's much more dynamic and insightful than what's offered by DNA, which can only tell us about risk rather than predict the actions of your proteins. Within a decade, Agus predicts, people will be able to upload their protein information onto a personal biochip for an individualized plan of action, including both preventive measures and therapies for identified ailments like imbalances in blood sugar (diabetes) or uncontrolled cell growth (cancer).

Their doctors won't just examine them once a year; they will continually monitor them. But they will only be able to know what to do because patient data will be continuously added to a universal database and fed into new trials and experiments, speeding up our understanding of which drugs work best for which people. This database of millions upon millions of patients might show, for example, that people with a particular genetic profile respond to one type of cancer treatment but not to another. As more people anonymously add their health data, the database would become more and more effective as a tool for preventive medicine. The problem with health care today is that not enough is known about the body to practise preventive medicine, Agus argues. We're stuck in the diagnostic model, waiting for an obvious symptom to emerge—and at that point, doctors are usually treating a disease that has had every opportunity to progress.

If we continue to "hoard" our health information, as Agus puts it, the future will never arrive. He's impatient with privacy worries—"I'm talking about taking all identifiers off"—and is hopeful, in a Facebook-era that demonstrates little concern with privacy, that the justice of his cause will bring people around. "I'll tell them that if we have this information, maybe their children will never have to suffer from the problems they have had. It's their right to demand an end to illness, and this is how it will have to happen." ✤

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