

We Paid A Writer To Find Out How She's Going To Die. And She Feels Pretty Good About It.

To join the new world of customized health, you'll first have to take some tests. How many test? Guinea pig Judith Newman swabs her way to self-knowledge.

By [JUDITH NEWMAN](#)



Oh, so that's how I'm going to die, I think, as Dr. Florence Comite explains the preliminary results of my blood tests. Apparently I have a particular gene that is Not Good. Comite, who is explaining all the tests on the phone, hears me start to hyperventilate. "No, no, really, it's not so bad," she says soothingly. "By eating a diet high in raw fruits and vegetables, you can actually turn the gene off!" Being an expert at turning things off (ask my husband), I should take comfort in this thought. Instead, I'm having trouble listening to the rest of the doctor's explanation, since I'm so busy weighing the relative merits of embalming versus cremation. I admit: Perhaps I was the wrong person to volunteer for this job. But volunteer I did, and there's no going back now.

We're entering a new era in medicine, one that promises to radically alter each of our lives. Personalized approaches stand to stop future aging and maximize your

health. They're in demand and in development and testing now. And you know what's at the starting gate for every one of these bespoke therapies? Effluvia.

In the coming months, I am going to be swabbing, bleeding, peeing, and <insert other bodily functions> for you. (Well, really, for me. But let's just go with the conceit that I'm doing it for you.) Saliva swabs from the company Skinshift will determine genetic markers in my skin that will allow me to assess my risks of sagging, wrinkles, and sensitivity to the sun, as well as the treatments that will keep these horrors at bay. Lifegenetics will study my DNA composition to determine the best way for me to not only lose weight but also maintain that weight loss. A company called Brain HQ, which calls itself "a personal trainer for the brain," will measure my cognitive skills and, reportedly, help me improve both brain function and memory. Which is excellent if true, since my current memory can best be summed up by the phrase "Wait, I did what in 1985?"

And then there's Florence Comite. She is beautiful and 400 years old.

One part of that sentence is true. She is a Yale-trained endocrinologist whose practice, ComiteMD, is at the forefront of what she calls "age management" via "precision medicine." A business like hers lures us with the siren song of Self, providing an in-depth measure of an individual's makeup, including metabolism, hormones, genomics, and numerous biomarkers, such as DNA telomeres. The idea is to help us avoid the preventable conditions of aging (or at least put them off until we're Willard Scott-worthy).

Isn't this a valuable goal for me, your average overanxious, underactive 53-year-old with 2 kids and 15 extra pounds? Certainly I think so, even if I fear what I'll find out.

And fear it I do. In a way, I'm the opposite of a hypochondriac: a pathological avoider of health information. I never make that once-a-year GP appointment; I waited 12 years after my children were born to see a gynecologist again. My first mammogram was at 51. That sort of thing. My reasoning has been that both my parents made it into their mid-80s, so I'll just trust in my good genes.

But my parents could have made it considerably longer if they hadn't been huge avoiders. For my father, doctor visits invariably involved an ambulance, because a situation had to reach DEFCON 1 status before he took action on anything. And my mother? She died of squamous cell skin cancer that could have been excised easily if she hadn't been too embarrassed to see a gynecologist about it. Instead, she ignored it over the years and let it grow inward, spreading to her vagina, bladder, and points north.

Did I mention my mother was a doctor?

I am trying very hard not to repeat history and instead to take advantage of what my parents never had: the opportunity to spot medical trouble looming far in the distance—and then avert it.



Some of the results have already come in. The unfortunate genetic marker I have is called 9p21. My version of this chromosome increases the risk of cardiovascular disease. It's not that big a deal, really. Fifty percent of the population has it. And given that pretty much everyone in my family dies of a stroke or heart attack, this shouldn't be a big shocker. Yet it's always a little unsettling to get a glimpse of the future.

I also learned that even though I have been taking replacement thyroid medication for hypothyroidism for many years, my body is not converting that drug properly. So I'm still thyroid deficient, a situation that's true for about one in every five people with a genetic setup similar to mine. Additionally, my testosterone levels are almost nonexistent. Testosterone is essential, in women as in men, for maintaining lean muscle, preserving bone, reversing diabetes, and protecting the heart and brain. It is also the hormone most responsible for libido. (Check out these 9 surprising treatments for low libido.)

"No testosterone?" my husband said. "Well, that explains a lot."

And then there's vitamin D, which is critically important for bone strength, especially as we age, because it helps us process calcium. Our bodies make it when we're out in the sun; we can also get it from certain foods, like fish, dairy, and

eggs. I eat little dairy and no fish, and my time in the sun is about equivalent to that of your average mole rat. "Congratulations, you win the prize for the lowest vitamin D reading I've ever seen!" Comite enthuses. "Let's plan to optimize D in your diet—and give you supplements." (Here are [8 foods rich in vitamin D](#).)

I can't wait to see what great shape my bones are in. It's probably a miracle that as I walk around, I don't collapse into one big pile of dust.

In the coming months, I will return to Comite for further tests and to decide whether I should make myself into a bit of a science experiment. Lucky you, you'll get to watch and maybe even learn from my mistakes.

I will discover not just what my cholesterol number is but also how big or small the cholesterol particles traveling through my bloodstream are—a much more crucial indicator, Comite says, than simply how much "good cholesterol" and "bad cholesterol" I have. I will find out, with as much precision as medical science can muster, my hormone levels and how I might adjust them (not just estrogen and testosterone but also progesterone, human growth hormone, insulin growth factor, and cortisol). I will learn my inflammatory markers, my bone density and body composition, my metabolic function (there may be a reason other than sloth and middle age that I can't seem to build muscle or lose those extra pounds), arterial health, and overall fitness levels. And I will find out what I can do to right the Titanic. "This isn't just about being in good health; it's about optimal health," Comite says. According to the ethos of personalized medicine, we shouldn't just treat illness; we should work on extending our wellness.

I'd like to know that I'm going to be around to watch my 13-year-old twins graduate from college or to spring them from prison, whichever way it works out. I'd like a sharper memory and more energy and better skin and—more. I'd just like more. Over the next few months, I plan to learn as much as possible. And yet I'm scared. I think the notions that "information is power" and "information is frightening" are not mutually exclusive. So there's a combination of curiosity, dread, and cautious optimism: Maybe I can take action before I get in serious trouble. In some ways I suppose I already have.



Here's a small sampling of the dozens of tests I'll be subjecting myself to for the sake of science:

- **Body composition and bone density:** The scary truth about my body-fat and lean-muscle percentages, plus how close my bones are to crumbling.
- **VO2 max calculator:** A measure of my cardiovascular fitness, based on how well my body uses oxygen (fancy!).
- **EndoPAT score:** Has my fixation on cheese-filled dates wrapped in bacon affected my arteries? This measurement unmaskes the inflammation throughout my body.
- **Cardio IQ:** I'm going to get heart disease, I know it. This test will lend my paranoia some DNA- and cholesterol-particle-based legitimacy.
- **Sleep imaging:** In which some kind of Big Brother machine monitors me while I sleep, and then judges me for my repeated bouts of old-boyfriend stalking at 3 AM.
- **uBiome:** Revelations about the bacterial life in my gut—in exchange for sh*t.
- **Skinshift:** Has sunscreen been doing its job? Just how many more liver spots can fit onto one woman's face?
- **Brain HQ:** Tests memory, attention, brain speed, intelligence, and people skills, aka my worth as a human being.

"8 Things I Learned After Being Poked And Prodded For 6 Months In The Name Of Personalized Medicine"

By [JUDITH NEWMAN](#)



"I know you don't believe me, but just listen for a second!" Dr. Florence Comite is doing what she has done in every conversation we've had for the past 6 months: talking me off the ledge. For half a year, I've gone deep into the world of personalized medicine. I've been poked, prodded, and data gathered, not just courtesy of Comite, a leader on this crazy medical frontier, but via a vast number of at-home tests, too. I've shed more bodily fluids than the cast of a Charlie Sheen sex tape. My DNA has been decoded; my blood and guts have given up all their secrets. And every time I learn something new, even the faintest whisper of future problems, I panic.

"I get why this stuff worries you," Comite says soothingly. "But a lot of what's wrong can be completely reversed." An over-promise? Quite possibly. But one I'd like to believe right now? Absolutely. The idea behind precision medicine—which eschews one-size-fits-all approaches in favor of interventions that are highly customized for the particulars of you—is this: The more specific our medical treatment can be to our own corpus, the better our chances of sidestepping

disease and feeling, not to mention looking, our best well into later life. Recently, President Obama recognized the need for this approach in the form of a 2016 federal budget that includes \$215 million earmarked for a Precision Medicine Initiative.

POTUS has a great deal of company in thinking that precision medicine is in our interests. Like, say, the country of Iceland. If you are an Icelandic citizen, you can volunteer to put your DNA into a national database, and your medical decisions can be based on your personal profile. The UK has a similar system. If you find this idea a bit Big Brotherish, all I can tell you is, get used to it. This is about to be the largest health-care science experiment you didn't sign up for.

It also is sometimes lifesaving. One-size-fits-all drugs are giving way to targeted therapies that are often more effective and less taxing on the body. If you have cystic fibrosis, for instance, there are new drugs that treat not your symptoms but, rather, the underlying genetic mutation that causes them. If you have certain types of cancer, you might get a similarly specific regimen. And if you aren't sick, well, the onslaught of available tests from Comite and her peers will find the diseases or the pre-diseases or the pre-pre-diseases that you do have.

That's where my own interest comes in. As I confessed to Comite, I saw both my parents bury their heads when it came to getting proactive medical information about themselves, which meant that when things went wrong, they went wrong in a spectacular fashion. My parents never saw doctors. Any interaction with the medical system generally involved a call to 911 and an ambulance. This was particularly true of my mother, herself a doctor, who did that thing that absolutely no one does: die of a very treatable squamous-cell skin cancer that she left alone for so long, she allowed it to eat away at her insides. Suffice it to say I didn't want my parents' version of old age to be mine.

And there was another, perhaps slightly more pressing, issue at hand: For the past 2 years, I'd been a little tired, just not quite myself. That chronic lack of energy could not be entirely explained away by my sleep habits (I get 7 to 8 hours) or stress levels (admittedly high, but that's what P.G. Wodehouse and Words with Friends are for). Something was missing. Did I just have to resign myself to being achy and tired at 53? I wondered if precision medicine could reinstate the energy I had in my 40s.

Scores of tests later, I have my verdict. In the process of getting here, I gleaned a lot of things—and one very important thing: Learning about your health is not for the faint of heart.

Lesson #1: DNA testing confirms much of what you already kind of know.

My first foray into the future of medicine last fall involved mailing a small vial of spit

to Slovenia. There's a company called LifeGenetics stationed there, allegedly because the CEO, Jure Zadavec, is Slovenian. Maybe that's true. Or maybe he is using the DNA of unsuspecting Americans to clone a master race of health-obsessed neurotics. I don't care. I was just happy when, 10 weeks later, the first facts of my genetic destiny arrived in the form of a great big notebook with graphics I could understand—information that, in not being surprising, was reassuring.

For approximately \$300, the company performs two types of tests (one oriented toward weight loss, the other toward disease prevention) analyzing 71 genes that are associated with everything from heart health to various kinds of addiction. I learned that my DNA has set me up to be nearly impervious to nicotine addiction. My first impulse when I read this—*Great, I can smoke occasionally at parties and look cool for once in my life*—was immediately tempered by the news that I have a higher-than-average risk of being harmed by the chemicals in cigarettes, a risk that is obviously already considerable for everyone. *Oh.*

My LifeGenetics information kit seemed to read my mind. It did not want me to think I could get away with anything. "We congratulate you on not smoking!" it said. Something about that exclamation point rankled. Yeah, fine, I get it. Kind of patronizing, aren't you, information kit?

A few other things I learned: I have gene variants that give me a slightly elevated chance of accumulating homocysteine, an amino acid associated with strokes. Despite having a mother who was seriously overweight, I don't carry certain genes associated with obesity, which means that the extra 20 pounds I carry are attributable to greed, not heredity. There are also genes associated with salt metabolism and increased blood pressure. For someone who'd like to carry a salt lick around like some sad, chubby reindeer, this was not great news. But with a family history of high blood pressure, it's also not a shocker, and it's useful to know.

Also useful: a sense of what exercise suits me best. It turns out that I can excuse the fact that I'm not a sprinter, since my genetic aerobic profile is like the anti-USain Bolt. But the fact that my sons refer to my musculature as "fluffy" is nobody's fault but my own: I actually have genes that stand me in good stead for muscle-building activities like weight training. I took this news to heart and stepped up the weight reps with a trainer.

Lesson #2: Health data makes you irrationally cutthroat.

I never considered myself a competitive person. Then I found out about telomeres. Telomeres are "caps" at the ends of each strand of DNA that protect our chromosomes. Over the years, as our cells replicate, these caps have a tendency to fray and shorten. The length of our telomeres is an excellent marker for our real, biological age and a predictor of how long we will live. I sent a bit of

blood to a laboratory in Spain called Life Length and had my telomeres tested, and they are almost exactly the average length of those among people my age. Now, one could construe this as good news; you could be a perfectly fit-looking 50-year-old with the telomeres of a 70-year-old. But it turns out that 25% of people my age have more long telomeres. That means 75% of my contemporaries will likely croak before me, but 25% will live longer. *Twenty-five percent.*

Are you my age and are your telomeres longer than mine? You are no longer my friend. The rest of you: I'll see you in the obituaries, suckers!

The Results Are In

A sampling of the measures to which I subjected myself in the name of science (and eternal youth):

VO2 MAX CALCULATOR

This measure of my cardiovascular fitness was delivered by a frighteningly buff man. Given how much time I spend sitting on my ass, I did surprisingly well.

UBIOME

In a bid to make myself feel superior, I compared data about the bacteria in my gut to that of a known population of heavy drinkers. This plan backfired.

Apparently, heavy drinkers have more bugs that protect against weight gain than I do. Apparently I should drink more?

LIFEGENETICS

Seventy-one genes tested, 90 pages of results, infinite things to worry about.

YOUSCRIPT

This test uses genetics to predict how a person might respond to different medications. I learned I do not have certain genes associated with bleeding when taking aspirin. Which, given my slight propensity for arterial plaque, Dr. Florence Comite says, means I should start taking a baby aspirin every day. Huzzah.

SKINSHIFT

Has sunscreen been doing its job? Just how many more liver spots can fit onto one woman's face? If only my sample hadn't been tainted (or was it lost?), then we would know.

TA SCIENCES

Telomeres will tell you how much time you have left to live. I have an average amount of time left for someone my age. This makes me unreasonably angry.

Lesson #3: There's a lot that can go wrong when the average Jane collects her effluvia and packs it off via US Postal Service.

During those early exploratory months, I vowed to try yet another DNA-analyzing service: Skinshift, created by a Texas dermatologist named Ruthie Harper. For \$349, the company would analyze several different genetic factors in skin cells, including collagen formation, sun protection, and antioxidant protection. But here's the wrinkle (oh, I slay myself): In the process of the company changing laboratories, either they misplaced my sample or it became tainted—I was never sure which.

Here was one of very many things that threaten to go haywire in this new era of testing. Timothy Olah, a bio-analytical researcher at Bristol-Myers Squibb who leads a team of scientists looking for new and better diagnostics, is excited about the prospect of precision medicine, particularly if markers for serious diseases like cancer can be used for early detection. But right now he has many questions. "How do you guarantee the integrity of any blood, urine, or saliva sample?" he asks. "How is the sample collected? How stable is what you're trying to measure?" And, just as important: "How accurate is the information, and how is it delivered to the physician and, ultimately, the patient?"

One of the first companies to offer at-home DNA services, 23andme, shut down after receiving a scathing warning from the FDA voicing concern about the tests' accuracy and the possible ramifications of people getting life-changing news delivered by, well, nobody. (Now the company sells genetic ancestry information.) Getting an e-verdict on collagen from some fly-by-night company might be fine, but do we want to be told we are at great risk of developing Alzheimer's later in life by a notice in an e-mail in-box?

Thank me for not smoking. According to my genes, I am not very prone to nicotine addiction yet way more sensitive than average to cigarette toxins. Is that a wash?

Lesson #4: There are other ways this whole thing could really bite us in the ass.

Speaking of finding out you might have Alzheimer's (or rapidly shrinking telomeres): If DNA testing gives us a crystal ball into our future health, do we want to look, or do we want to turn away? I posed that question to many friends, thus ensuring my unpopularity at dinner parties. "I want to know nothing," said a friend who's been smoking since she was 15. "I want to know everything," said one cheerful vegan/hypochondriac. Perhaps Julie Cristal, a writer and mother of two from Shaker Heights, OH, spoke for most of us: "I'd ask the medical experts to share only stuff that's preventable or curable. I would not want to know anything that involves a ticking time bomb."

That's true not only because we don't want to worry about health issues that are unavoidable but also because of our current system. Since 2008, it has been illegal for health insurance companies to kick people off the roster because they took genetic tests that imparted bad news. But life insurance and disability insurance companies are under no such obligation. It is telling that, knowing what they do about insurance, several of the doctors I talked with would absolutely not go for any genetic testing, despite the wonderful and lifesaving possibilities.

"Some feel empowered by this information, and some are made anxious by it. Guess which camp I fall into?"

Whether we like it or not, it's likely we all will be offering up our genetic information soon. "It is possible at some point that, unless you consciously opt out, every time we get blood drawn or get some kind of routine physical, our genetic information will be entered in a data bank," says Richard Boxer, a professor at the David Geffen School of Medicine at UCLA. As a scientist, Boxer doesn't object and, in fact, thinks that all this data collection could lead to some extraordinary breakthroughs in medical treatment. But, he adds, we have to make sure our laws protect people whose information turns out not to be the cheeriest.

Lesson #5: Even when precision medicine does not offer surprise, it offers nuance.

A few months into my medical adventure, I had collected reams of fun facts about myself—and changed nothing about my health. That's when I sought out Comite for some guidance and discovered that she is a cross between your high school's cutest cheerleader, a hummingbird, and a Jewish mother: She cannot rest until she cheers and nudges you into good health.

But first, even if you've already sent your spit to Slovenia and your blood to Spain and your skin cells to God knows where, you must take more tests. Lots and lots more tests. Comite and other "precisionists" use a far more comprehensive panel than the one for your average yearly checkup, measuring, for instance, not just the levels of your various types of cholesterol but also their particle size and texture. (My "bad" LDL particles were large and puffy, so no Crestor for me.)

When my first round of results came back, Comite instructed me to start a regimen of T3 thyroid hormone to supplement the T4 that I'd been taking for years. As she explained to me, some people who take T4 find that, for them, it does not convert to T3, which is important for daily function. So I added the T3, against the objections of my regular internist, who sighed loudly and gave me a massive eye roll.

Other tests also told a more nuanced story than the one I usually received from my internist. A look to see if I have certain genes associated with bleeding when taking

aspirin revealed that I don't. Which, Comite said, given my slight propensity for arterial plaque, meant I should start taking a baby aspirin every day. (Should you take a daily aspirin?[Here's how to tell.](#)) My ability to metabolize carbohydrates is fine, although results weren't quite optimal on the HbA1c test, a common test to predict risk of diabetes by measuring the percentage of hemoglobin that's covered in sugar. So-o-o...I don't have diabetes, and I don't have prediabetes, but I could have pre-prediabetes?

Oh, for God's sake. It seems to me that if you have pre-prediabetes, you have a condition known as Not Diabetes.

"Remember, this is not disease medicine, this is health medicine," said Comite gently. "We are letting you know all the ways you can make yourself healthier before you have any sort of problem."

With that, she sent me away with recommendations—for exercise, eating better, lowering stress, supplementation, taking daily aspirin, and so forth—to improve my biomarkers, or what she calls "the future determinants of disease."

I decided I would suspend disbelief and do everything she told me. Or at least everything that didn't require hours on an elliptical.

Lesson #6: Without proper hormone balance, nothing else matters.

Over the course of the voluminous tests Comite performed, she determined that I had virtually no testosterone. None. Now, what with being a middle-aged woman, I'm not supposed to have it oozing from every pore. But I am supposed to have some. And I wanted it, though not so much for its touted libido-enhancing effects, because it turns out that God, with his sense of humor, has not seen fit to gently make that disappear as I sink into decrepitude. I'd already started taking estrogen and progesterone to survive menopause, but Comite suggested that if I put a tiny dab of dude cream in the crook of my knee every day, I might reverse that flagging energy I was dealing with. She also pointed out that not only does testosterone help build muscle mass and protect against osteoporosis, it can also have a protective effect on the heart (though other doctors and the FDA disagree). There have been no studies on its long-term safety. Maybe I'd be that study.

The whole subject was endlessly fascinating to my husband, John. For the first 3 days I was taking testosterone, he checked in with me constantly. How did I feel now? Now? How about now? I can always tell when he's working on a theory.

"Dr. Comite said your testosterone levels were virtually nonexistent," John said, warming to the subject. "Yet you still managed to work, deal with the kids...You went to the gym sometimes...You didn't seem exhausted. Do you think that's because I supply you?"

"What?"

"Well, you know, when we're...together. Testosterone is easily absorbed through the skin."

"You're wondering if your sperm is the only thing that keeps me upright, is that what you mean?"

"I don't know if I'd put it like that, but one has to wonder. Perhaps you want to ask the doctor?"

I did not want to ask the doctor. But one thing I know: Testosterone has made an enormous difference. Estrogen stopped hot flashes, and daily progesterone made me more even-keeled emotionally. But it took testosterone to make me feel good. The tiniest dose has not only produced the much-touted sex-drive boost (perhaps it works a little too well...Hello, sailor!) but also put enough pep in my step to make me not dread the morning or the gym. And while my muscles are still fluffy, after 2 months of T, they seem slightly less so.

Lesson #7: My parents actually had a good thing going.

Here's my biggest takeaway from all the testing: I am overall a healthy person. For that I am profoundly grateful.

But.

The more you know, the more you realize that most of the time you are not either healthy or sick. Your numbers tell you that you are forever on a journey from one to the other. There are those who feel empowered by this information, and there are those who are made anxious by it. Guess which camp I fall into?

When I started this journey, I said I wanted to escape the fate of my parents, who were both health-information avoiders. I noted that if they'd been more proactive and not ignored the conditions that killed them, they would have lived beyond their mid-80s. Now my feeling is more like: Hey, they made it to their mid-80s! I hope I can do that well and avoid the niggling worries that come with constant monitoring.

My RDA, Per My DNA

Now that I have intel on how various nutrients affect people with my genetic profile, I'll tell you what I've changed about my diet: When I order a margarita, I abstain from the salted rim. Usually. Sometimes. Baby steps!

MORE: [21 Healing Herbs And Supplements Doctors Prescribe](#)

Lesson #8: Even someone who hates change can change. A little.

Ruling out any that required major effort or willpower, yes, I made some changes. I took baby aspirin, T3, testosterone, and a series of vitamins and minerals regularly. I did a little more weight training. I certainly didn't change my diet or cocktail consumption, but I did try to find novel ways to relax. For me, getting away from it all sometimes involved renting a hotel room in New York City for the day and not telling my family. I love hotels. I love being alone. And I'm lucky, as I confess this, that my husband never reads anything I write.

Even those small tweaks led to measurable improvements. My blood levels of cortisol, a measure of stress and the ability to manage sugar, were significantly down. (Thank you, Priceline.) My circulating thyroid hormones had returned to robust levels, "which makes your brain and metabolism very happy," according to Comite. My testosterone had returned to a healthy (and apparently heart-protective) level. And, maybe most important, I'd returned to having the kind of energy I'd been sure I would never again have.

The one thing that hadn't improved was my vitamin D levels, so the doctor prescribed some sort of supersonic prescription vitamin D pill. This pill will increase my calcium absorption, which, I'm told, will ensure that, in a few years, I won't crumble to dust like a mummy in a horror movie.

And the telomeres? Surely there is nothing I can do about something as fundamental and basic as these strands of DNA?

Think again, says Comite.

There is a Chinese herbal supplement called astragalus, which in high doses and over a period of several years allegedly halts the shortening of the telomeres and may actually lengthen them.

Viagra for telomeres? Oh, please.

I'll be starting on the supplement next week.