



### // MISSED THE LAST ISSUE?

All stories from *Proto*,  
Summer 2013, are available  
at [protomag.com](http://protomag.com).

## Surgical Decisions

“On the Same Page” (Summer 2013) addresses a central issue for the ethical practice of surgery: informed consent. As a surgeon, I am critically aware of how informed consent has changed over the last several decades. It is no longer appropriate to assume that the doctor knows best. As your piece correctly points out, the new paradigm for surgeons and patients is “shared decision making,” which requires surgeons to pay attention to a patient’s values while providing information to pave the way for an informed decision.

However, respecting the autonomy of the patient does not mean informing the patient of a menu of options without any recommendation. The recommendation of the surgeon should be based on the goals of the individual patient, but the failure to make any recommendation is to shirk one’s responsibility as a surgeon. Patients should expect their surgeons to be more than waiters describing the menu. Patients expect more and should get it.

**Peter Angelos** // Professor of Surgery, University of Chicago

## Room for Improvement

I read with great interest “Medical Errors From the Patient’s View” (Summer 2013). I share the view that patients can and should be partners in improving the quality and safety of health care. The concept of patient reporting of adverse events has the potential to overcome some of the limitations in the current provider-reporting initiatives, and to identify potential safety issues and opportunities for improvement that may not always be apparent to providers. Patient self-reporting of their experience of care, including the widespread adoption of the Agency for Healthcare Research and Quality’s (AHRQ) Consumer Assessment of Healthcare Providers and Systems Surveys, has transformed

the way we evaluate and redesign care.

However, while patients can be a valuable source of information regarding their experience of care, patient reporting of outcomes would have to be cross-checked with the medical record before being reported as accurate. For instance, a patient with redness around her surgical wound may be inclined to report an infection, when in fact a red wound does not always signal infection.

In summary, I applaud AHRQ for engaging patients more directly in our efforts to improve the quality, safety and patient-centricity of health care.

**Kevin J. Bozic** // Professor and Vice Chair, Department of Orthopaedic Surgery, University of California, San Francisco

## Bated Breath

“In One Breath” (Summer 2013) provides an excellent update on breath tests. It effectively illustrates the tension between the excitement of clinical researchers and hesitation on the part of practicing physicians.

The beauty of these breath tests is that they are pushing powerful metabolomics toward the doctor’s office. The introduction of “omics” in medicine raises understandable resistance among doctors because it relies entirely on statistics and bioinformatics. Therefore, let us all follow the international STARD guidelines for testing diagnostic accuracy and avoiding false-positive discovery when using molecular signatures.

The European Respiratory Society has launched a task force on exhaled breath analysis to validate and harmonize the sampling, analysis and clinical testing of breath tests. I urge *Proto* readers to join.

**Peter J. Sterk** // Department of Respiratory Medicine, Academic Medical Centre, University of Amsterdam

 **WHAT’S YOUR TAKE?** Write to protoeditor@mg.h.harvard.edu to comment on a story—or offer suggestions for future topics.

**stat:** an abbreviation for the Latin *statim*, an adverb that signals a need—for a surgical instrument, a medical supply or, as in this magazine, a short, compelling story—to be met without delay.



ED JONES/GETTY IMAGES

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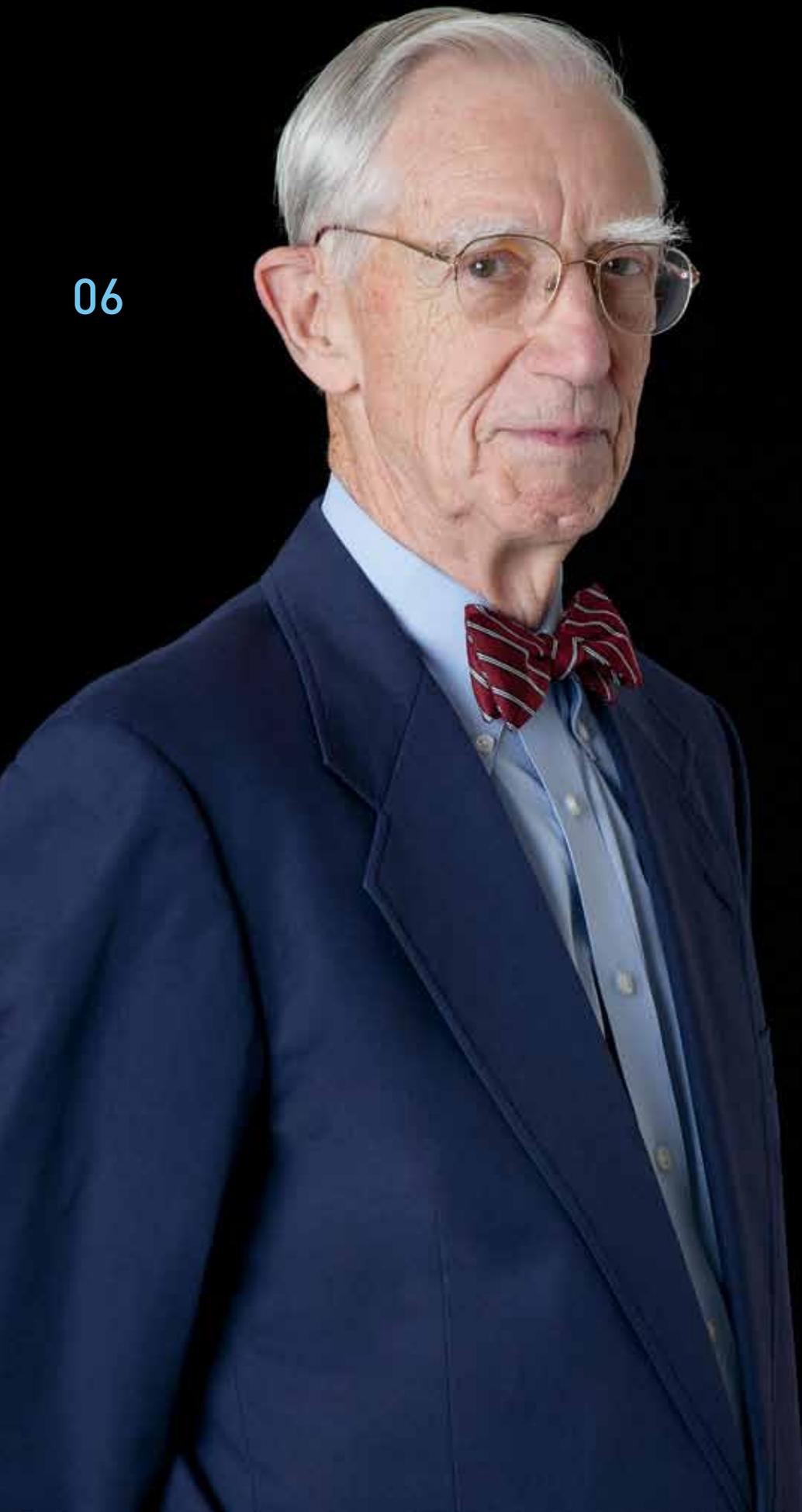
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## FOCUS //

**A MASSIVE UNPLANNED STUDY** demonstrating the health impact of air pollution began when, in 1950, China's Mao Zedong began providing free coal for winter heating to residents north of the Huai River. Because China imposed a household registration system that restricted mobility, people in the north breathed air that was 55% more polluted than that in the south, according to a recent analysis of meticulous government records in *Proceedings of the National Academy of Sciences*. The records also detailed the ages and causes of death in the static population, which allowed researchers to determine that for every increase of 100 micrograms of pollutant particles per cubic meter, people lose about three years of life to cardiovascular and respiratory disease. The 500 million people in northern China may lose an average of 5.5 years, for a total of 2.5 billion lost years of life.



INTERVIEW //

## Rooting Out Disrespect

■ BY LINDA KESLAR

*When Lucian Leape, during a recent talk before 7,000 members of the American Association of Critical Care Nurses, asked the crowd how many had witnessed or suffered abusive behavior in their workplace during the past three months, a majority raised their hands. Leape wasn't surprised. Known as the father of the modern patient safety movement, Leape is now making news for his scrutiny of the "culture of disrespect" in medicine, which he contends is a barrier to patient safety and quality of care. Leape, a former pediatric surgeon who helped write the Institute of Medicine's two seminal reports, *To Err Is Human* in 1999 and *Crossing the Quality Chasm* in 2001, says poor work relationships threaten safety improvement efforts. In a two-part series published last year in *Academic Medicine* with colleagues at Harvard Medical School, Leape delved into the forms disrespectful behavior can take and its toll on the safety of both patients and health care workers, and he provides recommendations to improve the situation.*

**Q:** You've described health care culture as dysfunctional, not only in teaching disrespectful behavior but also in tolerating, even rewarding, it.

**A:** I've found it useful to think about the issue in two very different categories: overt and covert. Overt is when people really hurt other people's feelings with their intentional behavior: disruptive, demeaning conduct or dismissive treatment of nurses, patients or students. What I mean by covert are individuals who aren't good followers of protocols or safe practices like disinfecting their hands, are chronically late, don't get charts done, just aren't good team players. And then there is the health care workplace itself—the high risk of physical injury and the stressful environment of long hours and heavy workloads. These are all forms of disrespect.

**Q:** What does disrespect look like from a patient's perspective?

**A:** The most obvious form is waiting. Much more serious, though, is not getting a full explanation of what's going on. Another example is, when something goes wrong, a lack of honesty in admitting what exactly happened. Also, what strikes patients as disrespectful is

having to fill out that clipboard every time they go to a physician's office regardless of how many times they've been there.

**Q: But what does disrespect have to do with safety?**

**A:** First, there's the influence of people who are overtly disrespectful, which is often powerful and corrosive. If, as an institution, you tolerate such behavior, you block communication and destroy morale, both threats to safety. Covert disrespect undermines the implemen-

**A:** Virginia Mason Medical Center in Seattle, to look at one example, has made a huge effort to address behavior issues. Its 5,000 employees are put through a training course about respectful conduct, and the hospital has established best practice methods, such as respecting the confidentiality of employees who report problems. Vanderbilt University Medical Center has created a patient advocacy reporting system that tracks complaints about physicians and then provides physicians with data and feedback,

## ■ The covertly disrespectful are chronically late, don't get charts done, just aren't good team players.

tation of safe practices (such as hand hygiene) and the teamwork that is needed for people to work together and develop new, safer practices. Just consider that the prevalence of physical harm—such as needlesticks and back strain—is much higher than in other industries, yet hospital personnel have accepted those risks as a hazard of the trade. And I don't think most people have thought about long resident duty hours as a form of systemic or institutional disrespect. When we put people in a position in which they'll be significantly sleep deprived, we are knowingly putting them in a situation where they are more likely to hurt someone else or themselves.

**Q: What are the solutions to these problems?**

even interventions, to address problems. Two-thirds of physicians showed improvement after such actions were implemented. And there's a lot of work we can do to improve the patient experience in terms of reducing waiting, how we treat patients and how we deliver information to them.

**Q: What's the biggest challenge in creating a culture of respect?**

**A:** Too many people in leadership positions feel they shouldn't be telling physicians what to do. But this is about involving them in solving problems, and that fits the role of all health care workers. People work in health care because they want to serve others, do something important and do it right. You couldn't ask for a better group of people to make these improvements. ■

BY THE NUMBERS //

## A Gutsy Procedure

**4th** Century of the first record of fecal transplants being used to cure stomach bugs in China

**100,000** Approximate number of deaths in the United States each year in which *Clostridium difficile*, a bacterium that infects the gut and causes antibiotic-associated diarrhea and a host of other complications, is a contributing factor

**15 out of 16** Number of people with recurring *C. difficile* infections (CDIs) cured with fecal transplants—the process of transplanting stool from a healthy individual to the gut of someone with a CDI to re-establish a stable microbial community—in addition to antibiotics, in a study published in *The New England Journal of Medicine*

**4 out of 13** Number of people with recurring CDIs cured with antibiotics only, in the same study

**100 trillion** Number of native micro-organisms in the colon

**100 billion** Typical number of bacteria in a milliliter of stool

**3** Number of months in 2013 during which the Food and Drug Administration required physicians wishing to perform a fecal transplant to submit an investigational new drug application; the requirement was repealed in July in the face of evidence that the therapy worked

**94** Percentage of CDIs examined in the Centers for Disease Control and Prevention's Emerging Infections Program data from 2010 that were acquired in health care or nursing facilities ■

07

INFOGRAPHIC //

## The Rise of Medical School Debt

■ BY TIMOTHY GOWER // INFOGRAPHIC BY FLYING CHILLI

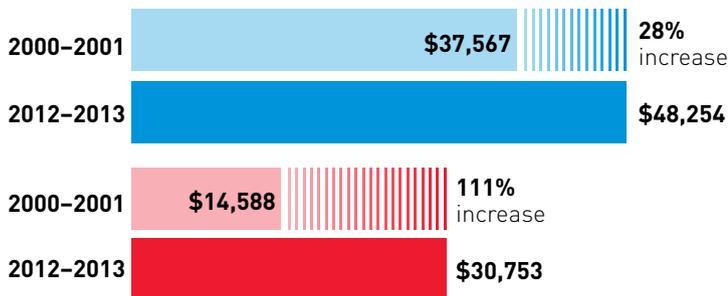
Many medical students today graduate with six-figure education loans. Are concerns about debt and future income influencing who applies to medical school and the career choices of graduates? The career-choice question seems particularly pressing, given widespread concern that mounting debt is steering new physicians to enter high-paying specialties at a time when primary care doctors are in short supply.

### The cost of medical school continues to rise.

The price of higher education has grown steeper for all students in recent years, but attending medical school remains the most expensive form of post-secondary education in the United States.

### Median annual tuition and fees at U.S. medical schools

(adjusted for inflation) ■ Private ■ Public

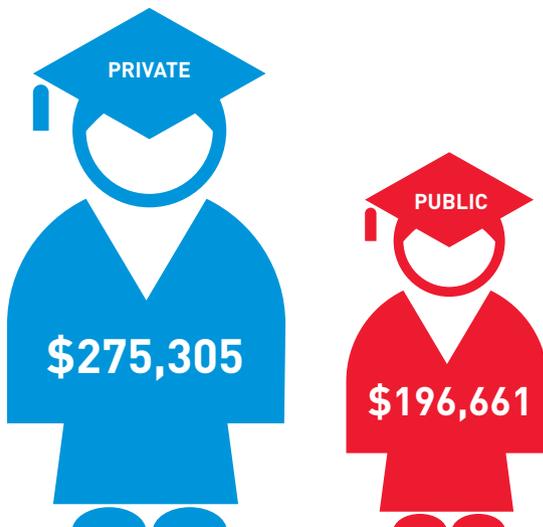


Costs at public medical colleges are rising at a faster clip largely because states have **cut financial support for higher education** since 2008.



### The cost of graduating in 2012

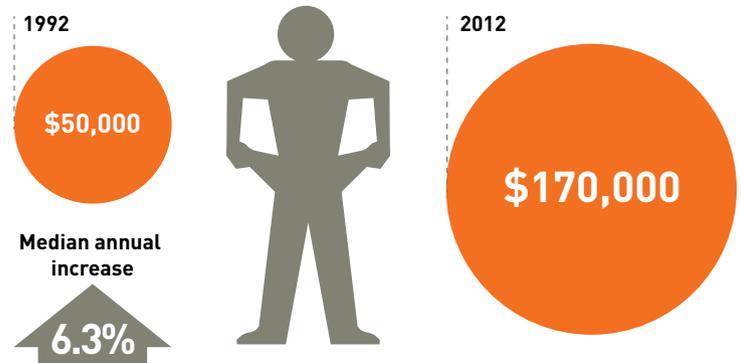
including tuition, fees and living expenses after four years



### Medical school students are graduating with unprecedented debt.

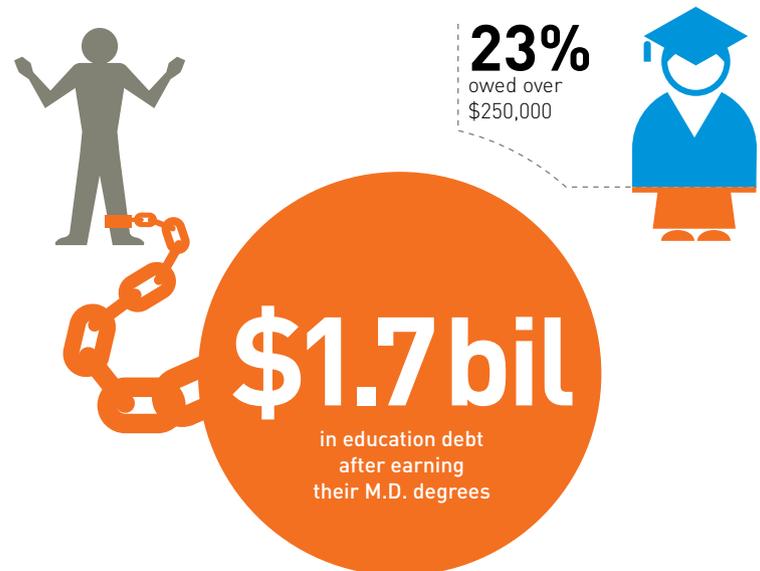
As recently as the early 1960s, two out of three medical students graduated debt-free. By 1984, more than four out of five students graduated with loans to pay back, a proportion that has held steady. However, the amount of money the typical medical school graduate has to repay has skyrocketed.

### Median debt owed by U.S. medical school graduates



Several studies suggest the medical school class of 2012 has

Among private medical college graduates with debt in 2011



### Payback time

Typical amounts owed when repayment is deferred until after residency

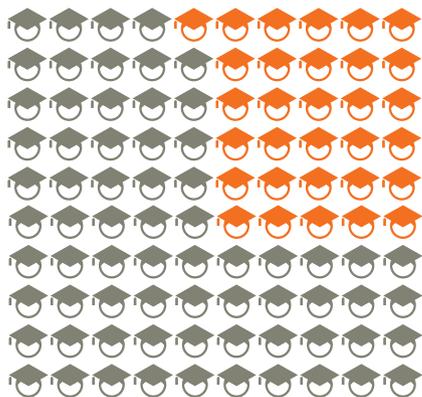




## Concerns about paying back medical school debt may influence career choice.

It's widely assumed that many medical students avoid primary care because of its comparatively lower salaries.

A 2012 study in *Medical Education* found



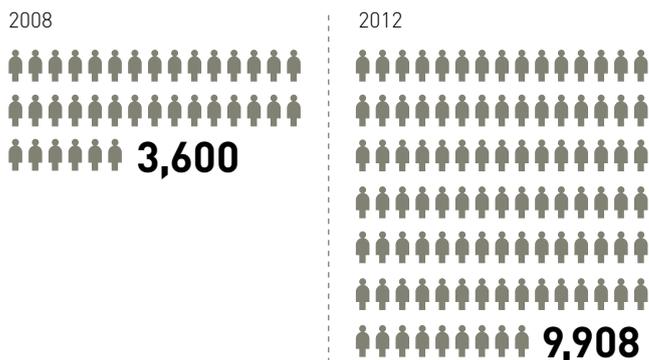
**31%**

of students who set out to become primary care physicians switched to a high-paying specialty by the time they graduated

## Trade-offs may be necessary for some students to choose a career in primary care.

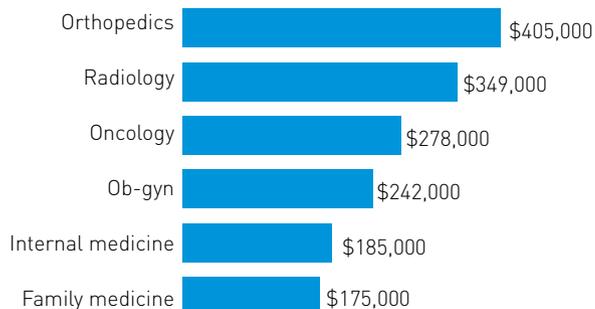
A 2013 paper in *Academic Medicine* showed that primary care careers are viable for students who owe \$200,000 or more, but may require creative financing or enrolling in a program such as the National Health Service Corps (NHSC) or Public Service Loan Forgiveness (PSLF).

### Number of clinicians in the National Health Service Corps



## How much do physicians earn?

Average annual income of physicians in the United States, by specialty



### MILESTONE //

## Mother's Little Helper at 50

In 1941, when chemist Leo Sternbach transferred to the U.S. headquarters of Hoffmann-La Roche laboratories, fleeing his Basel home in advance of the Nazis, he began with innocuous work: synthesizing vitamins. But that research would propel him to become one of the company's top scientists, and in the mid-1950s he stumbled upon benzodiazepines, an entirely new category of tranquilizers that were capable of calming the mind without compromising mental functioning.

The first of these, Librium, was followed by an even better "benzo" that Sternbach and his team synthesized in 1959. Diazepam—which the company's advertising team dubbed Valium, after the Latin *valere* (for "to be healthful")—was more potent than Librium and lacked its unpleasant aftertaste. Valium went on to become the pharmaceutical industry's first \$100 million brand, and, according to Andrea Tone, author of *The Age of Anxiety: A History of America's Turbulent Affair with Tranquilizers*, diazepam "rapidly became a staple in medicine cabinets, as common as toothbrushes and razors."

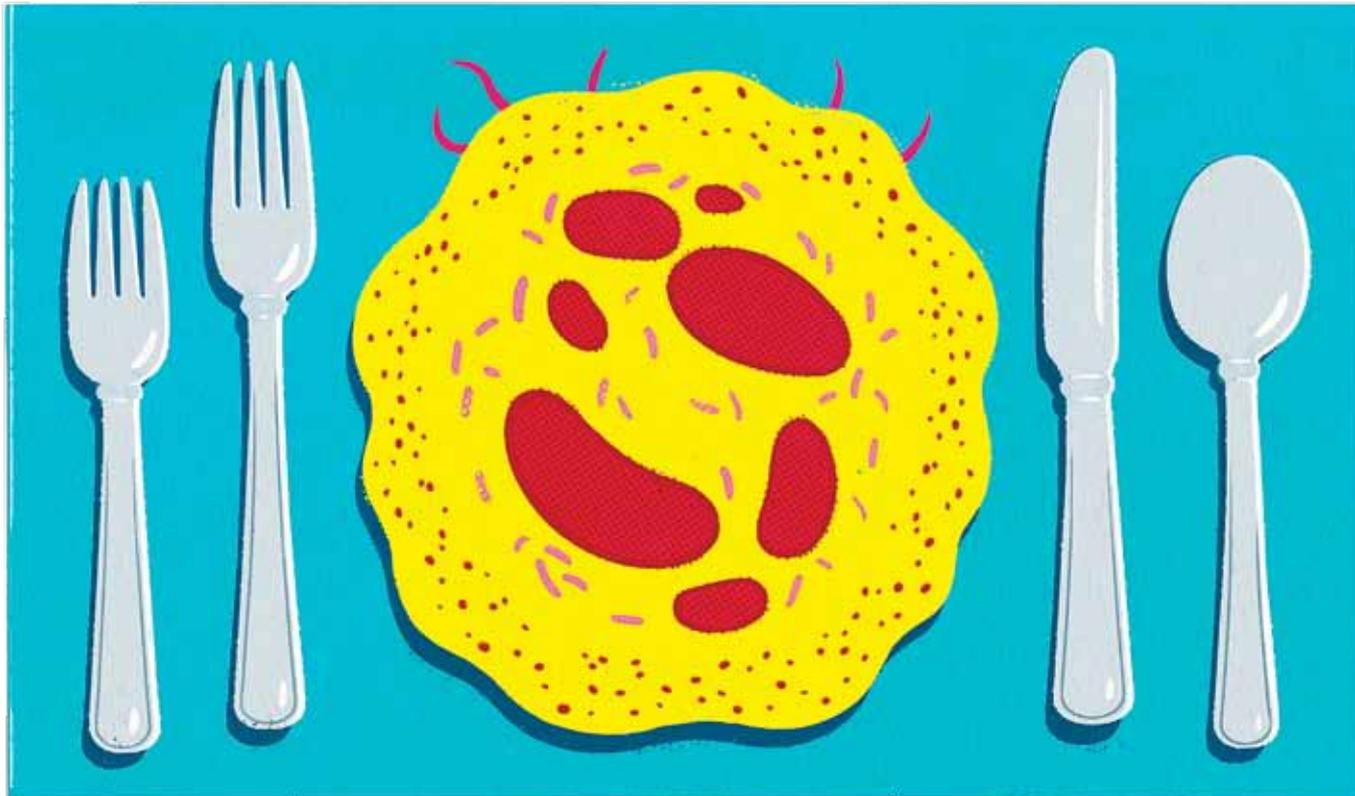
Approved by the Food and

Drug Administration in 1963, Valium has now been with us for half a century. From the late 1960s to the early 1980s, "Mother's Little Helper" (as described by the Rolling Stones in a 1966 song) was the Western world's most widely prescribed drug. At its peak of popularity in 1978, Americans consumed more than 2 billion of the tablets.

But not long after Valium's approval, it began losing some of its luster amid reports of addiction. In 1967, the FDA concluded that enough evidence existed to impose controls on diazepam similar to those on amphetamines and barbiturates. Though Hoffmann-La Roche insisted Valium was safe, lawsuits ensued, and by 1975 the U.S. Justice Department ordered benzodiazepines to be classified as Schedule IV drugs, impeding access by limiting refills.

Prescriptions dropped from 61.3 million in 1975 to 33.6 million in 1980. Increasing restrictions paved the way for a shorter-acting tranquilizer, Xanax, introduced by Upjohn in 1981. But Valium never disappeared. One reason, says Tone, is that "no one's ever questioned the efficacy of tranquilizers like Valium because there's such overwhelming evidence that they work. Unlike psychoanalysis and psychotherapy, Valium's effects are immediate." ■

CLASSICSTOCK



## LAB NOTES //

## A Second Act for Phages

■ BY RACHAEL MOELLER GORMAN

Almost 100 years ago, in a Paris laboratory, Félix d’Hérelle peered at cultures packed with dysentery bacteria. He had cultured the organisms from the stool of people with the disease, and usually the bacteria blanketed the entire plate. This time, however, d’Hérelle saw something different: “plaques,” or holes, dotted the bacterial smear in cultures from people who were recovering.

D’Hérelle, a bacteriologist who had traveled from Guatemala to Turkey and Tunisia studying pathogens, finally figured out where the holes had come from: A virus that replicated only in the presence of dysentery was attacking the bacteria. He dubbed the virus a “bacteriophage” (literally, bacteria eater), and realized that these bacterial predators,

which killed bacteria but spared the hosts, harbored tremendous potential. D’Hérelle began experimenting with the bacteriophages and soon used them successfully against dysentery, which at that time had no other consistently effective treatment. Phage therapy, propelled by d’Hérelle, gained an enthusiastic following throughout the 1920s and 1930s.

The enthusiasm was short-lived, however. Alexander Fleming’s discovery of penicillin, the first antibiotic, and its escalating production and use during the 1940s relegated phage therapy to a footnote in Western medical history. But now, as antibiotic resistance shelves previously effective treatments and doctors become desperate for something new, throwback phage therapy is piquing researchers’ interest.

The concept makes intuitive sense. Bacteriophages typically target and kill a single bacterial species, unlike the

harmful kill-off of beneficial gut flora that happens with broad-spectrum antibiotics, and so reduces the risk of resistance. (Broad-spectrum antibiotics accelerate resistance to not just one but to many antibiotics.) In addition, only a tiny dose is required, because the viruses insert their nucleic acids into the target bacteria to replicate their genetic material and make their own new viruses until so many are produced that they kill off the target bacteria.

What’s intriguing is that phage therapy never disappeared from certain pockets of the world, particularly Eastern Europe. Poorer than the West and unable to afford the new antibiotics, doctors in the former Soviet republics of Georgia and Russia and parts of Poland clung to the treatment; the years have brought a slow evolution of phage therapy through trial and error, and to this day, phage treatment is the

standard of care for bacterial infections in Georgia.

Western researchers are starting to pay attention. In 2009, researchers in the United Kingdom conducted the first controlled clinical trial of a bacteriophage treatment, in patients with chronic, painful, antibiotic-resistant ear infections caused by *Pseudomonas aeruginosa*. That bacterium forms tiny ecosystems—biofilms—that shield it from many antibiotics, so the researchers applied one small dose of Biophage-PA, a cocktail of six bacteriophages that target *P. aeruginosa*, to the ears of 12 patients, while 12 other patients received a placebo. After a few weeks, symptoms of the ear infections declined overall in the phage group, and three of the 12 patients were below the limit of detectability and essentially symptom-free.

In addition, a May 2013 study in the journal *Proceedings of the National Academy of Sciences* found that bacteriophages are not just an effective treatment for infection but also a key defense used by animals (including humans) against pathogen attack. Microbiologist Jeremy Barr and colleagues at San Diego State University showed that bacteriophages in mucus from a variety of creatures are actually symbiotic with the animals. The bacteriophages in the mucus (the first line of defense against pathogens) attack the bacteria that show up there; the phages get food, and we get protection. “This could potentially be a prophylactic treatment,” says Barr. For example, scientists could target the *E. coli* strain that causes food poisoning. “We might engineer a phage that attacks that strain and ingest the phage in our food and water supply, and it would stick to our mucous membranes and potentially protect against subsequent infections.”

Despite increasing interest in phage therapy, however, limitations abound.

Though it is used in Eastern Europe, “they don’t really have the regulatory agencies we have in mainline Europe or in America,” says Catherine Loc-Carrillo, a phage researcher at the University of Utah. No large-scale, randomized, double-blind, placebo-controlled trials have yet examined phage therapy. In addition, no one knows exactly how the immune system deals with bacteriophages, and some phages contain the Shiga toxin gene, which causes food poisoning.

Still, scientists are optimistic that they will be able to generate phages that precisely target particular bacteria or pull from premade libraries of phages to create cocktails to treat many different types of bacteria. Interestingly, though, these cocktails would probably change over time. “Phages are very promiscuous. They tend to swap their genes quite

readily, and under certain circumstances you could end up with a group of phages that is different from what you started with,” says Loc-Carrillo. That could affect phages’ effectiveness. FDA regulations would most likely require each new phage to pass intense study before allowing any changes to approved treatment formulations, making approval of phage therapy long and difficult.

Moreover, some experts are concerned that phages, meant to combat the scourge of antibiotic resistance, may themselves breed resistance. If phages do evolve to kill a broader range of bacteria, then they will give those many types of bacteria an opportunity to mount their defenses and become resistant.

Only time and much more study will tell whether phages will be deemed effective—and their fickle nature acceptable. ■

## CUTTING EDGE // Power Struggle

In June the Food and Drug Administration issued a warning about the increasing risks of cyber attacks on medical devices and hospital networks. The FDA listed hospital computers, smartphones and tablets, and implanted patient devices as potential targets, indicating that malware—software designed to disrupt operations or gather sensitive information—could affect not only devices attached to hospitals’ internal networks but also implanted life-saving or -sustaining devices that can be programmed via the Internet.

Stopping such attacks can be difficult, in part because medical devices run proprietary or custom software that may not be protected by off-the-shelf consumer security software. But now a group of researchers believes there might be a backdoor solution, based on the fact that malware subtly changes power consumption. A collaborative research team from one Chinese and four American universities has developed a prototype system called WattsUpDoc. By monitoring the amount of electricity a device consumes, the system can determine—with 89% to 94% accuracy—whether the device has been infected with malware. Malware intrusions, which are essentially added software, usually increase the workload on a device’s hardware, which in turn requires increased power consumption.

The FDA reports that despite the potential dangers of malware, no injuries have been reported. After further testing, WattsUpDoc could help keep that safety record intact. ■



ON THE BLOGS //

## The Red-Tape Blues

*Frustrated with a health care system that impedes practicing medicine, these physician-bloggers search for ways to dig out from under piles of paperwork and reconnect with patients.*

### Your Cheatin' Heart

*Adapted from a June 23, 2013, post on Musings of a Distractable Mind, a blog by primary care physician Rob Lamberts.*

Hi. I'm Rob, and I am a recovering doctor. Things are tough, but they are a lot better since I left my destructive relationship with Medicare, Medicaid and insurance companies. I've had to learn how to manage my own money (now that I can't count on them to bail me out), but things are looking a lot better.

The key was when I realized that the system wasn't going to change no matter how much I accommodated its unreasonable requests. I felt that if I only did what it asked of me, however unreasonable, it would stop hurting me and, more important, my patients. But I've come to see that all the promises to take care of me and my patients were written in sand, and that it couldn't resist the temptation to cheat on me. I tried to do what it asked of me, but as time went by I couldn't take how dirty it made me feel.

I want to believe it was sincere when it told me it wanted to change. I think at its core, it wants to help patients and doesn't want to go on those spending binges. But no matter how sincere the promises sounded, I was always left alone as it threw its money at every sexy treatment, procedure or drug that walked by. Then it would go off on tirades about how much I spent and that I didn't do enough to keep to our budget. It was

always my fault. I think it's just easier to pass blame to others than it is to do the hard things necessary to really change. To be honest, I think it was terrified at how much real change would hurt.

### Crisis of Conscience

*Adapted from a March 26, 2013, post on In My Humble Opinion, a blog by Jordan Grumet, an internist in Highland Park, Ill.*

The world is changing for providers. Heavily Medicare-weighted, the past few years have seen a proliferation of administrative paperwork. When not overwhelmed with forms, we are hunched over computers inputting inane information like ethnicity. What we are not doing is taking care of patients. We are not interfacing with those we have sworn to care for. The covenant I have so often written about is being replaced with vague ideas of community health and meaningful use. In no uncertain terms, we are letting you (the patient) down. This makes me ill.

A few months ago, I had a crisis of conscience. I could no longer sign off

on this willful subjugation of the doctor/patient relationship. So I crunched the numbers. What I found shocked me. Most of the revenue from my practice comes from nursing home work. In other words, all those hours spent in the office and the hospital did exactly one thing: They paid the bills for that very office and all my employees. It's a zero-sum game. I would be better off economically if I finished each day at 9 a.m.

### How to Cut the B.S.

*Adapted from an Aug. 18, 2013, advice post written by electrophysiologist and guest blogger Jay Schloss on the blog of Dr. John M, also an electrophysiologist.*

Here are some tips for survival in the new health care environment:

**Minimize the B.S.** Don't confuse box-checking with delivery of health care. Sail through the B.S. as quickly as you can. Save your creative juices for the parts of your documentation that people actually read. Just focus on meeting regulatory compliance and not setting yourself up for a lawsuit.

**Mobilize support for change.** Do your job, but don't take all this lying down. Doctors got into this mess by not speaking up. If we continue to roll over, it's only going to get worse. Make yourself a positive agent of change. Speak up in e-mails, meetings and hall conversations with administrators. Get a voice in social media. Because most of your colleagues are as passive as deer in the path of a truck, your voice can be heard.

**Hold fast to your values as a doctor.** No matter how bad it gets, do not—I mean *do not*—let go of your values as a caregiver. You know that quality metrics do not ensure quality. Keep doing the extra stuff that regulators don't notice or measure. If that means seeing fewer patients, then so be it. Each patient you treat needs to see you at your best. ■



UPDATE //

## A Malaria Vaccine Clears a Hurdle

BY CATHRYN DELUDE

Developing a malaria vaccine is a particularly knotty problem: Vaccines typically can target only one or a few antigens—proteins produced by infectious organisms, against which the host’s immune system mounts an attack. (A vaccine, which is full of these antigens, spurs immune cells to churn out antibodies that will patrol the body and, should the infectious organism itself invade the body in the future, summon other cells to destroy the organism.) Malaria, however, is caused by a parasite that produces more than 5,000 potential antigens.

As described in “Smoking Out Malaria” (Summer 2012), one innovative approach to a vaccine involved using a whole malaria-causing parasite in attenuated (weakened) form, which was expected to be more effective because all of the parasite’s antigens in a particular life stage would be on display—and open to immune system attack. Although an initial trial that

involved injecting the vaccine under the skin was disappointing, results of a second trial in which the vaccine was administered to volunteers intravenously (allowing parasites to rapidly enter the bloodstream as they do during an infected mosquito bite) yielded astounding results.

According to research published in *Science* on Aug. 8, 2013, scientists grouped the trial’s 40 participants according to how frequently they received the vaccine and at what dosage. Of the nine volunteers who received four injections of the highest dose over several months, six were immune to malaria when later given a controlled malaria infection. Moreover, all six subjects who received five injections of the highest dose were completely protected from malaria. There are now plans for further trials of the vaccine in the United States, Germany and several African nations to test its safety and efficacy in larger numbers of volunteers and to see if it protects against other strains of the parasite.

Previous efforts involved irradiating infected mosquitoes, rendering the parasites too weak to cause disease,



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but still able to trigger a potent immune response. Among volunteers bitten by 1,000 or more irradiated mosquitoes, more than 90% were protected from malaria. However, such a method of administering a whole parasite vaccine was clearly impractical.

The breakthrough vaccine came about when researcher Stephen Hoffman founded a company, Sanaria, in 2002 to make a practical vaccine that could be injected with a needle and syringe, developing a method for dissecting salivary glands from mosquitoes by hand.

Critics express doubts about scaling up that approach for larger trials and mass vaccination campaigns in Africa. But Hoffman estimates that it would take only three dissectors working one hour to extract enough for the 40 participants in the trial reported this past August, and he’s working with robotics and microfluidics engineers at Harvard University to automate the process.

Skeptics further worry, however, that five intravenous injections are unworkable in sub-Saharan Africa for a number of reasons, including the fact that patients are remote and trained staff are hard to come by. Hoffman says that the next set of clinical trials will address how to reduce the number of required doses, but that if five doses are required to eliminate malaria, “we will work out how to implement the vaccine.” ■

DEFINED //

**super-utilizers** [sü-pər yü-tə-,līz-ərs] n: patients with multiple chronic conditions who overuse emergency departments and hospital inpatient services, and who are the focus of increasing efforts to coordinate care and thus keep them out of the hospital.

Also known as “frequent fliers,” these patients often have a history of substance abuse or mental illness and have trouble getting consistent primary care because they are homeless, lack transportation or health insurance, or don’t understand how to use the health care system.

Because their care is poorly coordinated, super-utilizers account for a disproportionate share of health care spending. In 2002, Jeffrey Brenner, a physician in Camden, N.J., examined insurance claims data from local hospitals and discovered that 20% of the patients in Camden were responsible for 90% of the hospital costs. Brenner joined with three local hospital systems and other providers to form the nonprofit Camden Coalition of Healthcare Providers. They launched a citywide program that provides super-utilizers with coordinated care that’s more cost effective. A care management team made up of a social worker, a health outreach worker and a nurse practitioner helps the patients obtain medical and social services, get transportation to medical appointments, find housing, and apply for government benefits. ■