What Good Is Science Writing?

Journalism about medicine continues to inform and enlighten. Is anyone paying attention? p30
## STAT

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Trust in journalism, as with other professions, has reached critical lows. For those who try to bring scientific facts to the public, what does the future hold? // Illustration by Jim Tsinganos

### proto: a prefix of progress, connoting first, novel, experimental. Alone, it conjures an entire world of the new: discoveries, directions, ideas. In taking proto as its name, this magazine stakes its ground on medicine’s leading edge—exploring breakthroughs, dissecting controversies, opening a forum for informed debate.
IN SEPTEMBER 2005, Massachusetts General Hospital launched Proto, a magazine that took readers to places where innovation was unfolding and introduced fascinating people pushing the boundaries of medicine. The cover story of that inaugural issue looked at pandemics, focusing on H5N1—avian flu—which was then in the crosshairs of the Centers for Disease Control and Prevention. Experts warned of the potential for a deadly global outbreak, “long overdue,” and cautioned that failing to prepare for such a pandemic could prove disastrous.

Almost two decades later, and for nearly three years, Proto has teased with stories about the COVID-19 pandemic—its origins, treatment and prevention as well as descriptions of disparities in care and clinician burnout. This issue considers how a vaccine might be made in just 100 days and features an essay from a science writer about the challenges of covering COVID while battling misinformation with science and facts.

Between the bookends of one pandemic that was evaded and another that is devastating has been a labor of love and a true privilege. We thank our colleagues at Outdosh Meredith for their enthusiasm, creativity and commitment to the vision and mission of Proto. We also salute the MGH Proto Team as well as the dedicated members of our editorial board for their wisdom, expertise and guidance. Nearly 17 years of Proto—provide information from medicine’s leading edge, exploring breakthroughs, dissecting controversies and providing a forum for informed debate. The Proto website, proto.com, will continue to house a rich archive of stories, perspectives and images. And we salute the MGH Massachusetts General Physicians Organization team as well as the MGH Client Partnerships.

FOCUS
Scientific papers rely on figures—excluding the graph, butterfly wing and protein diagram pictured here. These particular images, however, allow blind scientists to see data just as well as their sighted peers. The lithophanes can be printed in minutes on a $3,500 printer, with resin that costs less than 50 cents per image. A recent study published in Science Advances found that blind participants were able to interpret data from these lithophanes as well as or better than sighted individuals. Blind scientists have, until now, generally relied on braille, screen readers, and tactile models that cannot differentiate the details of many images and datasets. Inventive accommodations such as these are sorely needed. Nearly 9% of graduates awarded doctoral degrees in biomedical sciences report one or more disabilities, according to a 2021 report from the National Science Foundation. Poor workplace accommodations may be one factor in the finding that these scientists are significantly less likely to receive research grants.
Prescription

The medical toolkit.

Lem thinks they should be part of healing? Family physician Melissa Can encounters with nature be enabled doctors to prescribe national park passes to patients. Since she nation program, PaRx, which recently partnered with Parks Canada to British Columbia. She directs Canada’s first national nature prescrip- the world, sparked interest in prescribing doses of nature.

are still coming into focus, such findings have, for physicians around nature. You can find nature in your community garden, backyard or in a city park. The research shows that patients see health benefits when they feel that they’ve had a meaningful nature experience.

Q: What’s been your own experience prescribing nature to patients?
A: The bulk of patients I would tend to write a formal prescription for are people with mental health concerns. It’s usually part of an overall treatment plan; we wouldn’t typi- cally withhold medication and prescribe nature first, unless the symptoms are very mild. As with any prescription, the physi- cian should check in and see how patients are doing as time goes on. That provides them with support and also shows them that it’s a serious recommendation.

I have to say I was initially a bit nervous about prescribing nature. I thought patients would see me as some out-of-touch, tree- hugging doctor. But every time I’ve pre- scribed it, patients nod their heads and say, “You’re right. I do feel better when I spend more time outdoors.” When a doctor formal- izes that in a prescription, patients are more open to doing it. And there’s research about exercise prescriptions, showing that when something is written down, it increases a patient’s motivation to actually carry it out.

Q: What are the challenges for patients in filling a nature prescription?
A: One is transportation, especially for people who don’t live in nature-rich areas. Another issue is time. People are really busy. One good strategy is to substitute outdoor activities for things you typically do indoors. For instance, if you usually go to the gym, do your workout on a trail or in a park. Or if you’re going to meet friends at a restaurant, head outside for a picnic instead.

Making people feel comfortable and safe in nature is also important. Some people haven’t spent much time outdoors because it’s not part of the culture they grew up in.

The British Columbia Parks Foundation runs an initiative called Healthy by Na- ture, which gets marginalized groups out into nature. We’re working on expanding this nationwide.

Q: What’s next for nature prescriptions?
A: There are currently two national nature prescription initiatives worldwide, one in the United States and one in Canada. Other countries have reached out to us for advice on launching something similar. This is a phenomenon I would love to see spread across the world, because prescribing nature isn’t only good for humans, it’s good for the planet. Research shows that people who are more connected to nature are more likely to engage in pro-environmental behaviors such as recycling and conserving energy. I like to think that every time I write a nature prescription, I’m doing something for the environment.

A growing body of evidence suggests that spending time in green spaces can have a range of beneficial effects—improving blood pressure as well as reducing anxiety, depression, ruminative and neural activity in brain regions associated with mental illnesses. While the mechanisms can have a range of beneficial effects—improving blood pressure as well as reducing anxiety, depression, ruminative and neural activity in brain regions associated with mental illnesses. While the mechanisms are still coming into focus, such findings have, for physicians around the world, sparked interest in prescribing doses of nature.

One leader in “nature prescriptions” is Vancouver physician Melissa Lem, a clinical assistant professor of family practice at the University of British Columbia. She directs Canada’s first national nature prescrip- tion program, PaRx, which recently partnered with Parks Canada to enable doctors to prescribe national park passes to patients. Since she helped launch the initiative in 2020, the program has attracted some 6,000 physicians—more than 5% of the country’s practicing doctors.

Q: When did you start thinking about the health benefits of nature?
A: I started “self-medicating” as a child, I think—whenver I felt stressed, I would go to a natural place where I intuitively felt safe. When I moved back to downtown Toronto after working as a rural physician, I experienced nature deficit for the first time. I just felt my stress level increase.

Q: What is a nature prescription look like?
A: Based on the latest evidence, our stan- dard recommendation is that patients spend at least two hours a week in nature and at least 20 minutes during each visit. Health care practitioners can then collaborate to refine the prescription based on a patient’s interests and abilities as well as what nature is nearby. We can find nature in your community garden, backyard or in a city park. The research shows that patients see health benefits when they feel that they’ve had a meaningful nature experience.

Q: What’s been your own experience prescribing nature to patients?
A: The bulk of patients I would tend to write a formal prescription for are people with mental health concerns. It’s usually part of an overall treatment plan; we wouldn’t typi- cally withhold medication and prescribe nature first, unless the symptoms are very mild. As with any prescription, the physi- cian should check in and see how patients are doing as time goes on. That provides them with support and also shows them that it’s a serious recommendation.

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COVID vaccines happened in record time. Could the next be even more rapid?

BY STEPHEN ORNES

The first vaccine for COVID-19 broke records: Only 342 days passed between the virus being sequenced and an FDA-authorized vaccine. Looking back, researchers now wonder whether it could be done even more quickly.

Speedier vaccine development for COVID-19 would have saved many lives. At 100 days, in April 2020, about 2.3 million people had been infected worldwide. By the time of the first vaccine approval, in December, that number had skyrocketed to 75 million.

"There’s much more we can do,” says Melanie Saville, executive director of vaccine research and development at the Coalition for Epidemic Preparedness Innovations, a foundation that focuses on vaccines and other biological countermeasures for epidemic and pandemic diseases. Saville and her colleagues recently published a roundup of ideas showing how streamlining current techniques could shorten the time to only 250 days. In an emergency, that timeline might be whittled down to just 100 days, as outlined here.

But that has to be in a situation where you have a highly lethal, highly contagious virus,” Saville cautions, noting the benefits of a vaccine would have to clearly outweigh increased risks.

The first COVID vaccine entered human clinical trials only nine weeks after sequencing. Using new tech, researchers could cut that time almost in half.

The key to curbing a pandemic is to get a new vaccine quickly into arms around the world, says Saville. The COVID pandemic exposed faults in the global public health response network. By July 2021, only 1% of people in the world’s poorest countries had received a vaccine.

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I Shall Be True

France is instituting an oath for new scientists. Can it combat fraud?
Mind the Children

To reduce burnout and retain staff, should hospitals embrace on-site childcare?

BY HANNAH THOMASY

The past few years have been a time of intense stress for many health care workers, and the effects are beginning to show: 40% of nurses and nearly 25% of physicians surveyed have said they expect to leave their jobs within two years (“I Quit,” Summer 2022). Although the causes of burnout are complex, childcare is a frequent potential solution.

Apple’s pre-pandemic study found that having children in institution-affiliated childcare reduced employees’ childcare-related stress and overall stress levels. And a growing number of hospitals and universities are taking heed. WellStar Kennestone Hospital in Georgia built a 17-classroom childcare center that also provides care for mildly sick children. Mass General Brigham, which already offered childcare, expanded those services during the pandemic. Many other medical centers, including Stanford University and Vanderbilt University, offer childcare on-site.

“Many more hospitals now want to do on-premises childcare,” says Priya Krishnan, chief experience officer and patient advocate at the childcare company Bright Horizons. “Conversations about establishing care have increased multifold for us in the past year and a half.”

Yet having a place for children at work is still far from the norm at medical centers. According to an Association of American Medical Colleges report, fewer than half of responding institutions provided childcare options prior to the pandemic, and of those, only about 60% had expanded childcare options since the start of the pandemic. Even when on-site childcare exists, many employees aren’t able to use it. About 20% of health center-affiliated childcare locations had waitlists of more than a year, and some are even longer. At the University of Washington, the wait for infant spots can be as long as three years, for example.

Cost is also a major factor. Infant care at academic health care centers is commonly between $220 and $400 per week, while nurses and residents, on average, make about $1,500 and $1,200 per week, respectively. Despite such barriers, however, offering convenient and affordable childcare not only helps reduce stress for those who have access, but also helps hospitals and other medical facilities attract and retain diverse groups of workers. Providing that core benefit may be a strong draw for women and people of color. Multiple studies have shown that female physicians have more childcare responsibilities than male physicians, and childcare stress is more prevalent in health care workers who are racial minorities.

“Yes, we want a diverse workforce, but can’t relive childcare stress for groups that disproportionately experience it, then the system is perpetuating inequities,” says Harry. “We need to look at the policies that drive some of these inequities. In this sense, childcare couldn’t be more important.”

MILESTONE

Living and Dying

The 1968 Harvard criteria for brain death face new inquiries.

BY HANNAH THOMASY

The 1960s were a time to question everything, and in medicine, this included the definition of death. “From ancient times down to the recent past it was clear that, when the respiration and heart stopped, the brain would die in a few minutes,” wrote anesthesiologist and medical ethicist Henry Beecher in 1968. But by the time of his writing, things had become much less clear.

Beecher, who practiced at Massachusetts General Hospital, had gained the national spotlight in a 1966 paper “Ethics and Clinical Research.” It outlined almost two dozen cases in which subjects of medical experiments had been put in grave dangers. The paper became a landmark and led to the creation of review boards that oversee all human experiments.

The task facing Beecher in 1968 was, if possible, even more fraught. Recent advances had dramatically changed the possibilities at then-frontiers blur once-established lines.

This statute has held firm, although ethical debates have continued, and one state, New Jersey, allows religious exemptions in defining death. It remains to be seen what will happen as new medical frontiers blur once-established lines.

This past summer, a team at Yale University was able to initiate activity in the brain, heart and kidney cells of a pig an hour after the animal had died. Because of the profound ethical implications of reversing brain death, the researchers used nerve blockers to forestall the possibility. But as medicine progresses, it is perhaps only a matter of time before the lines between life and death must once again be redrawn.

The 1968 Harvard criteria for brain death were catastrophically damaged. While physicians were careful not to conflate the two frontiers, a clear indication of when patients had no hope of brain recovery—or were “hopelessly unconscious”—might allow harvesting their organs in an ethical way for patients in need.

To define a permanently nonfunctioning brain, an ad hoc group of men, most with affiliations at Harvard University, was assembled. The group included several neurologists and a transplant physician as well as a lawyer, an ethicist and a public health scholar. Their “Harvard Criteria” outlined the medical characteristics of so-called brain death.

Although mental unresponsiveness was a controversial way to define death at the time, public and legal opinion gradually shifted to accept it. This was cemented in 1981 with the Uniform Determination of Death Act, which established that brain death was accepted as legal death throughout the country.

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The Medic Reinvented

Can medical AI on the battlefield make sound decisions about who lives or dies?

BY ADAM BLUESTEIN

In the fog of war, medical decisions come quick and hot. Someone must be on hand to assess injuries and make rapid decisions about who to treat and in what order, who should be evacuated and—in worst-case scenarios—who can’t be saved. Could the best person for this job be an autonomous artificial intelligence?

DARPA—the U.S. military’s research and development arm—recently called on experts in industry and academia to collaborate on a new decision-making tool that is “human off the loop”—in other words, completely autonomous. The In the Moment (ITM) project will focus first on small-unit battlefield triage but then will also aim to manage mass-casualty events.

A central requirement will be to dem-
It seemed like a minor incident. Peckish between cases, a top physician at a major health system grabbed an apple from a table in the hospital’s breakroom. But to the nurse who expected to eat the fruit, this was one insult too many. “Dr. Smith” often did things to rub people the wrong way. He was routinely condescending and once barked at a nurse, in front of a patient, to stop asking stupid questions. So this time, the owner of the pilfered apple filed a formal complaint. Smith thought what he’d done was trivial. Yet the nurse’s choice to escalate the encounter—a matter for the hospital’s review and possible censure—is emblematic of a turning point in attitudes toward the much larger problem of small indignities, a souring of good behavior among doctors, nurses and other health care workers. The problem of incivility is pervasive and can compromise performance and safety. “We’re here to take care of people, and we forget to take care of each other,” says Linda Groah, a nurse and chief executive officer of the Association of periOperative Registered Nurses (AORN), one of several national nursing organizations working to raise awareness of the problem.

In many walks of life, rudeness is on the rise. Anger and toxicity are hallmarks of social media platforms. Research shows that rude behavior spreads like a virus, not only through people who experience it but also through those who witness it, and recent polls suggest most Americans believe incivility has risen to crisis levels. It’s a particular problem in the workplace, where three out of four employees report they experience rudeness on the job at least once a week. But health care may be a hot zone for bad behavior, with verbal abuse and physical threats from colleagues and patients, ratcheted up during the COVID-19 pandemic, now at record highs. Small-scale irritants—eye-rolling, demeaning comments, gossip and a lack of cooperation—contribute to a general climate of disrespect and can lead to angry outbursts, verbal abuse and bullying. Soon, behavior may escalate to a

By LINDA KESLAR  Illustrations by GARY TAXALI
Incivility within medical teams can have dire results for other workers as well as patients. It may take the focus away from essential tasks, leading to medical errors and substandard care. It also drives employ-ers to leave their jobs during these days of rampant workforce turnover. "Now people across medicine have changing expectations about civility and improving how we should behave from the physicians on top—at the level where it has legal consequences, with formal complaints for harassment, discrimi-

nation, or other problems," says Christine Porath, associate professor at Georgetown University’s McDonough School of Business, who has studied uncivil behavior in nearly two dozen industries, including health care. In Porath’s research, health care ranks as one of the least civil industries, with its unique stresses triggering unkind and disruptive behavior. Moreover, medicine has long been built around a rigid, male-dominated hierarchy, and doctors find that the behavior their older peers have engaged in, and many are choosing the exit door. "They can’t believe the things mentors have told them they may have to put up with," she says. "Their response is, ‘No, I don’t.’"

Many physicians, bullied by an abusive status quo, don’t even realize they’re part of the problem. "A surgeon told me recently that until he received some very frank feed-

back, he had no idea most people thought he was a jerk," says Porath. "He was treating residents the way he’d been trained. There’s also a persistent star system in medicine, in which the bad behavior of rainmakers is tolerated. "Physicians who are big revenue generators are given a pass when it comes to offensive behavior," says an internist at a Pennsylvania hospital.

In national surveys conducted in 2003, 2011 and last year, the Institute for Safe Medical Practices asked health workers about disrespectful behavior and work-place intimidation. Respondents through the years have cited incidents of being demeaned by fellow workers. But in the most recent survey, the prevalence of insults targeting race, religion and gender, and they’ve reported a rising proportion of insults targeting race, religion and gender, and they’re reported more and more disrespect happening online, that’s in real-life and in virtual meet-

ings. Reports of physical assaults have also doubled since 2013. A 2022 Medscape survey of 1,500 physi-
cians found that more than 80% said they had witnessed bullying and harassment by other doctors. Offenders were mostly male and in their 40s, and respondents identi-

fied oversights as a frequent source of trouble. But this awareness of the problem went only so far, with 83% of those surveyed saying that medical conduct hadn’t contributed to the problem.

Emerging statistics about burgeoning workplace incivility almost certainly under-

state the problem because so much bad behavior goes unreported. "We encourage people to report incidents of rudeness and bullying, but even today there exists a power gradient that often prevents reporting," says Diane Colgan, a physician at Johns Hopkins Medicine-Suburban Hospital in Bethesda.

Other research suggests rudeness can amplify “anchoring bias,” the tendency to base decisions solely on the first piece of information received in a situation. Prior analyses have shown that anchoring is by far the most common cognitive error in medical diagnoses, and a study last year in the Journal of Applied Psychology showed that anesthesiology residents interrupted by rudeness from another physician were more likely to stick to an initial, anchored diag-

nosis, ignoring evidence that it was wrong.

S everal doctor and nursing groups are now trying to raise the bar on civil behavior. Last March, the American College of Cardiology (ACC) issued a policy document on building respect, civility and inclusion in the cardiovascular work-

place, and in October 2021 AORN and two other nursing organizations—the Ameri-
can Association of Nurse Anesthesiologists and American Society of PeriAnesthesia Nurses—released a position statement on the need for workplace civility. Both docu-
m ents urged health care organizations to adapt comprehensive policies. The ACC wants to see better awareness of the impor-
tance and prevalence of incivility, as well as clear repercussions for physicians and others who fall short. And although the problems of sexual harassment, discrimi-
nation and bullying are priorities for the group, the need to address more subtle forms of disrespectful behavior also became clear. "Rudeness during the project’s nearly two-year development, says Pamela Douglas, a cardiologist and professor of medicine at Duke University School of Medicine who helped write the document.
One institutional response to growing incivility is to make it easier to report. More than 180 U.S. health care systems (and dozens outside the country) have adopted the Co-Worker Observation Reporting System. Developed by Vanderbilt University's Center for Patient and Professional Advocacy (CPPA), the program compiles complaints electronically, processes the data and sends back reports to participating institutions. It has accrued data on some 100,000 physicians and advanced practice professionals, says Gerald Hickson, a physician and a founder of the CPPA. Complaints have been made against doctors of all ages, and 93% of reports involve harassment or physical threats. 

Incidents rise. The actions of Dr. Smith, harassment or physical threats. Doctors of all ages, and 93% of reports involve harassment or physical threats. More than 180 U.S. health care systems (and dozens outside the country) have adopted the Co-Worker Observation Reporting System. Developed by Vanderbilt University's Center for Patient and Professional Advocacy (CPPA), the program compiles complaints electronically, processes the data and sends back reports to participating institutions. It has accrued data on some 100,000 physicians and advanced practice professionals, says Gerald Hickson, a physician and a founder of the CPPA. Complaints have been made against doctors of all ages, and 93% of reports involve harassment or physical threats. Hickson says. But a fraction of offenders tend to account for a large number of complaints, and their misconduct may require escalating interventions. Smith was notified of the nurse’s complaint and invited to discuss the incident over a cup of coffee with a trained physician mentor. Normally, the coffee meet-up is sufficient, Hickson says. But some behavior as an organizational priority.

Sometimes behavior remains toxic, and hospital leaders need to rethink their tolerance even for star performers. In 2016, at UMass Memorial Health, the largest health system in central Massachusetts, the results of an employee engagement survey made clear that many of the staff were treated with respect. Organizations that have referred their policies have begun to move the needle. "The number one thing that people want to see is the sense of feeling valued," she says. "They want respect."

DOSSIER

Mastering Civility: A Manifesto for the Workplace, by Christine Porath, Balance, 2016. Porath’s rigorous research shows what incivility is costing leaders and organizations and offers practical suggestions for building a more productive work culture.

"2022 American College of Cardiology Health Policy Statement on Building Respect, Civility and Inclusion in the Cardiovascular Workplace," by Pamela S. Douglas et al., Journal of the American College of Cardiology, May 2022. A comprehensive report on the range and consequences of un civility in the cardiovascular workplace, as well as strategies for improvement.
Sarah's story is familiar in a country where more than 40% of adults and a fifth of children have obesity. At school, she was bullied for her weight and, starting in her teens, dreaded getting weighed by doctors because they were always critical. At age 26, she had bariatric surgery—yet after dropping 80 pounds, her weight returned. Year after year passed with cycles of strict dieting and trials of various anti-obesity medications. “The weight always came back,” says Sarah, who asks that her real name not be used.

Last fall, Sarah’s care team, including obesity specialist Fatima Cody Stanford, a physician at Massachusetts General Hospital’s Weight Center, recommended that Sarah try a new drug, semaglutide. “I knew within the first week that it was going to work,” says Sarah, now 46. “Without trying, I was eating less than what I normally did, but I didn’t feel hungry or deprived.” Within a year, she had lost 63 pounds. And although only time will tell whether the weight stays off, for now she feels as if “the battle is over” and she can get on with her life.
Treating people with anti-obesity drugs isn’t new. Historically, however, most indicated medications have proved ineffective, dangerous or both—between 1964 and 2009, 25 of these compounds were withdrawn from the U.S. market because of serious side effects, including psychiatric problems, cardiotoxicity, and drug misuse and dependence. Bariatric surgery works better, but the screening requirements can be prohibitive, most people don’t want the surgery, and the procedure isn’t always permanent.

New treatment semaglutide—approved in 2017 by the U.S. Food and Drug Administration to treat type 2 diabetes in 2021 for weight loss—and a second drug, tirzepatide, which received the Fast Track designations from the FDA for obesity treatment this past October, could improve on that record dramatically. Like most anti-obesity drugs, they target parts of the brain that control appetite. These medications get there in a novel way, mimicking naturally occurring hormones to help prevent overeating. In recent studies, patients taking semaglutide lost an average of about 15% of their total weight, and those taking tirzepatide for diabetes reported losing 15% to 21%.

“After years and years of trying, we can finally replicate the efficacy of bariatric surgery with medication,” says Louis Aronne, director of the Comprehensive Weight Control Center at Weill Cornell Medicine in New York City and an investigator on the tirzepatide trial. Yet optimism for a safe, attractive treatment for obesity—a condition that is estimated to cost the United States nearly $200 billion annually and underlies rising chronic disease—has been tempered by the rates of heart disease, diabetes, cancer and other conditions—is tempered by the current or past generations. According to Stanford, only 1% of patients with obesity received a prescription for obesity management drugs from 2011 to 2016, in part because of the drugs’ price. Moreover, obesity specialists note a persistent knowledge gap about how best to treat the condition. “Many physicians still believe that people with obesity need to eat less and exercise more, which is completely wrong,” says Stanford, who notes that it wasn’t until 2013 that the American Medical Association finally recognized obesity as a chronic disease.

“Obesity is where diabetes was 30 years ago, when clinicians would tell patients, ‘Stop eating sugar,’” says W. Timothy Garvey, director of the Diabetes Research Center and senior scientist at the Nutrition and Obesity Research Center at the University of Alabama at Birmingham. “Many physicians don’t believe that obesity should be treated medically, so they blame the patient for overeating and not exercising. In turn, patients blame themselves.”

Losing weight through diet and exercise—and keeping the weight off—can be hard to impossible for some people with obesity. According to a theory accepted in many quarters, the body has a defended fat mass set point—a fat mass that the brain, hormones and metabolic “wants” that person to have. The basic equation for losing weight—to expend more calories than you take in—can indeed lead to significant weight reduction. Yet because the body’s fat mass set point doesn’t recalibrate to the lower weight, body and brain continue to “nudge” the pounds back on. Environmental as well as genetic factors affect fat mass set point. Today most Americans have a fat mass set point that’s higher than ever before, thanks to a combination of pressures. These include readily available, highly processed foods; chronic sleep deprivation; an increase in stress levels; less need for physical activity; and social lives that revolve around food. Nearly three-quarters of the U.S. population is now considered to be overweight or to have obesity.

“WE CAN FINALLY REPLICATE THE EFFICACY OF BARIATRIC SURGERY WITH MEDICATION.”

People with obesity can also have the additional problem of a siren’s chorus of hormones being released from the gastrointestinal tract when you eat, nudging the pounds back on. “When people with obesity lose weight, there’s an increase in hormones that make you eat more while also making you not lose weight,” says Stanford. “The combined effect is that the brain is driving you back to a certain equilibrium of body fat mass—and that equilibrium is set much higher in people with obesity.”

Brain inflammation may also help explain why people with obesity have abnormally high fat mass set points. “Adults don’t grow additional fat cells,” says W. Scott Buttsch, director of obesity medicine in the Bariatric and Metabolic Institute at the Cleveland Clinic. “Rather, their existing fat cells expand when they gain weight and contract when they lose it.” When a fat cell expands, that increases inflammation in the body and, in some studies, in the hypothalamus, which centrally controls body weight. The chronic low-grade inflammation may disrupt the brain architecture that regulates the body’s fat mass set point.

Genetics also plays a major role. “If your parents have obesity, there is a 50% to 85% likelihood, regardless of your diet quality, activity level and stress management,” says Stanford. What obesity is not, however, is a behavioral disorder. “Just as people with diabetes cannot will their blood sugars to be normal, people with obesity cannot will their bodies to carry less fat,” says Aria Jastreboff, director of weight management and obesity prevention at Yale Stress Center and lead investigator of the tirzepatide trial. Yet this attitude of weight loss as a matter of will has pervaded culture and the thinking of many physicians.

Earlier anti-obesity drugs did little to inspire confidence that obesity could be successfully treated—or that medical treatment was appropriate. Over many decades, more and more such medications were withdrawn from the market for safety reasons, which only reinforced clinicians’ bias that overeating and personal behavior were the real problem, says Buttsch.

In 1973, fenfluramine was introduced for short-term use, and it was withdrawn in 1997 after it was found to stimulate the growth of muscle cells in the heart, leading to heart-valve damage and pulmonary hypertension. Another appetite-suppressing drug, sibutramine, was also associated with major cardiovascular problems, including stroke and heart attack, and was taken off the market in 2010. The most recent anti-obesity drug to be withdrawn was lorcaserin, pulled in 2020 because of cancer risks. It wasn’t until 2012 that reasonably safe, effective anti-obesity drugs came on the market. People who took Qsymia, a combination of phentermine and the migraine medication topiramate, lost an average of 8% to 10% of their body weight. Contrave, which combines naltrexone, used to treat alcohol and opioid dependence, and bupropion, an antidepressant and smoking-cessation drug, results in an average loss of 5% to 7% of body weight.

The new drugs, semaglutide and tirzepatide, contain a glucagon-like peptide-1 (GLP-1) receptor agonist, which mimics a hormone secreted in the intestines during eating that signals when a person is full and should stop eating. The GLP-1 receptor agonists increase signal that helps suppress appetite in people with obesity. “We think these medications help the brain resist the defended fat mass set point, resulting in people eating less,” says Jastreboff. “Often, they feel full earlier and don’t go back for seconds.”
Zotepin also targets a second receptor with another human gut hormone—glucose-dependent insulinotropic polypeptide (GIP). That additional target may explain why it tends to result in greater weight reduction than semaglutide.

Changes in GIP-L1 are also responsible for weight loss after bariatric surgery. “The surgery alters the speed at which food passes through the stomach, and that changes the hormonal milieu and causes people to have much higher levels of GIP-L1 after they eat compared with people who haven’t had surgery,” says Judith Korner, director of the Metabolic and Weight Control Center at NewYork Presbyterian/Columbia University Medical Center in New York.

A precursor to the new drugs, exenatide, was approved by the FDA in 2005 to treat type 2 diabetes. Also a GLP-1 receptor agonist, exenatide improved insulin secretion from the pancreas and regulated blood sugar. But it also had an unexpected benefit—significance weight loss—and that discovery led drugmakers to explore the potential of GLP-1 drugs to help people lose weight, says Samuel Klein, director of the Center for Human Nutrition at Washington University School of Medicine. In 2014, liraglutide, a daily injection, became the first GLP-1 receptor agonist approved for treating obesity.

Both semaglutide and tirzepatide are marketed for type 2 diabetes treatment—semaglutide at a lower dose than when prescribed for weight loss. But for reasons that aren’t yet known, people who have diabetes and take the drugs tend to lose fewer pounds than those who don’t have the disease. “That just underscores the importance of treating obesity early—before people develop type 2 diabetes or other weight-related diseases,” says Jastreboff. “If we can help someone avoid a significant amount of weight, we can treat the root cause of or main contributor to diabetes.”

Louis Aronne at Weill Cornell Medicine points out that well over 2 million people have taken GLP-1 receptor agonists since they were first approved for treating type 2 diabetes. That’s a substantial number to observe for side effects, and those patients have suffered few serious issues. Yet the phase 3 trial of semaglutide for obesity, which ran for 68 weeks and included nearly 2,000 adults, raised a few short-term side effects. Three out of four patients taking the drug had gastrointestinal problems, including nausea, diarrhea, vomiting, constipation—compared with half of those in the placebo group. More serious issues, including cardiovascular or liver disorders, were reported by 10% of the semaglutide group and just over 6% of the placebo group.

Sarah recalls feeling nauseous when she started taking semaglutide, but this side effect has since abated. Others reported needing to learn to eat more slowly and pay attention to feelings of fullness—and they sometimes vomit because their stomachs don’t empty as quickly as before. People who take the new drugs, which they inject at home, start on a low dose that is increased gradually over 17 weeks. “The GI side effects of semaglutide and tirzepatide usually occur as we’re escalating the dose,” says Jastreboff. “When people get their maintenance, those problems lessen and, most often, resolve.”

People who have regained weight after bariatric surgery may also be candidates for semaglutide and tirzepatide. “Our research shows that the use of anti-obesity medications can get people who’ve had surgery back to their ideal weight or even below that,” Aronne says.

Other drugs now being developed show promise for helping people lose even more weight. A recent article in Nature listed 26 compounds being evaluated in human trials. One combines semaglutide with an analog of amylin, a hormone secreted by the beta cells of the pancreas that delays gastric emptying after eating and suppresses glucagon, a hormone that stimulates glucose production. In a phase 1 trial, the amylin analog and semaglutide resulted in greater weight loss—up to 17% of body weight—than semaglutide alone. Other early trials are evaluating the effectiveness of GLP-1 agonists in concert with two additional compounds. “Combining a GLP-1 receptor agonist at a lower dose with one or two other compounds can reduce the gastrointestinal side effects of a high-dose GLP-1 therapy,” says Klein. “Many other chronic diseases, such as hypertension and diabetes, use such combinations of medications. So this is the future of effective obesity management.”

Yet even as these drugs work their way through the clinical trials, several structural issues may restrict the widespread use of existing drugs. For one, semaglutide and tirzepatide aren’t yet approved to treat children and younger adolescents, although obesity specialists stress the importance of helping young people overcome obesity, in particular as a way to head off type 2 diabetes. Trials on young people are underway, and in the meantime, some physicians say they’re comfortable prescribing the drugs off-label to kids. “It’s important to take extreme weight loss, whether from bariatric surgery or medications, also results in loss of muscle mass and bone density. Exercise can help counteract that effect, but researchers are also investigating pharmaceutical fixes. In a trial of bimagrumab, a monoclonal antibody, people with type 2 diabetes lost about 2% of total body fat but a nearly 4% increase in lean muscle mass. Still, the lack of insurance coverage remains one of the biggest obstacles—and one of the most frustrating to obesity specialists. “It’s a travesty that insurers will pay for 10 medications people take for weight-related conditions but they won’t cover the treatment that could help prevent those diseases,” says Korner.

The Treat and Reduce Obesity Act, which has ongoing bipartisan support in Congress, was first introduced in 2013 and would require Medicare to cover FDA-approved anti-obesity medications. Yet each year it has fallen short of the votes needed to pass, in part because of bias and misunderstanding about obesity among lawmakers and the CEOs of the Obesity Action Coalition. “Too many people still think obesity is a condition of personal fault, not a complex chronic disease requiring treatments like counseling, medications and surgery,” he says. One sign that attitudes may be changing is an announcement from the federal Office of Personnel Management that, beginning in 2023, anti-obesity medications will be covered for federal employees.

For widespread use of the drugs, though, primary care physicians will need to become more willing to prescribe them. Anti-obesity medications won’t be used effectively and efficiently unless primary care physicians are engaged in obesity treat-ment, say obesity experts. And a 15-minute appointment isn’t enough to manage the complex disease of obesity.

Moreover, no medication, however effective, can ban the unfair notion—from society, physicians and patients themselves—that obesity is a lifestyle choice. “Weight bias prevents patients from being informed, engaged and empowered. And it keeps clinicians from acquiring the training to provide anti-obesity interventions,” says Garvey. “Bias is the culprit that prevents optimal care of this disease.”

**DOSSIER**

1. **Treatment of Obesity: PharmacoTherapy Trends of Office-Based Visits in the United States from 2011 to 2016,** by Mechelle D. Claridy et al., Mayo Clinic Proceedings, December 2021. The authors document that only 1% of people with obesity who visited physicians received anti-obesity medication.

2. **Once-Weekly Semaglutide in Adults With Overweight or Obesity,** by John P.H. Wilding et al., New England Journal of Medicine, March 2021. This pivotal trial showed that weight loss from medical treatment can rival bariatric surgery and led to FDA approval of semaglutide for obesity.

3. **Describing the Weight-Reduced State: Physiology, Behavior, and Interventions,** by Louis J. Aronne et al., Obesity, April 2021. The authors describe the effects of behavioral factors, exercise and drug therapy in maintaining weight loss long term.
During his keynote lecture at a 2022 conference on medical images, Alex Frangi projected scans of the vasculature of two brains. Although the luminous tangle of blood vessels appeared to be all but identical in the two images, even to this audience of medical and computer science experts, only one image depicted a real human. The other had been created by a computer algorithm, mimicking what might be captured from a real patient through magnetic resonance angiography.

“I asked, which of these is real and which is synthetic?” says Frangi, who directs the Center for Computational Imaging and Simulation Technologies in Biomedicine at Leeds University in the United Kingdom. “It’s very, very difficult to tell.”

The creation of a brain image real enough to fool experts was far from an academic curiosity. Rather, it is central to a flourishing new field of synthetic data, which could change the way patients are diagnosed, how clinical trials are conducted and especially how artificial intelligence–driven tools—an arsenal proliferating across the medical landscape—are trained and perform.

AI tools require vast amounts of data to train their algorithms, and health care produces that data in torrential quantities. But health systems and other guardians of data are reluctant to share that information, in large part because of privacy concerns. It has also, historically, been extremely difficult for researchers to put most of that data to use.

Synthetic data, used to produce fake brains and other not-quite-real medical artifacts, can help solve that problem, giving researchers access to potentially unlimited numbers of images and histories they can use to train AI models, which in turn can diagnose illnesses, or model and predict how diseases such as COVID-19 affect populations. Another exciting use of synthetic data is taking off in the pharmaceutical industry, where “digital twins”—made-up subjects in clinical trials’ control arms—reduce the need for real humans.

In some of these cases, the manufactured data is purely numerical, providing the statistical parameters that make up a unique health profile. In other cases, it is visual, approximating scans, photos or other medical imaging. Yet the aim for most synthetic data is the same—to create exquisitely accurate models representing human subjects to further science while keeping people out of harm’s way. The possibilities of that approach, and its limits, are only beginning to emerge.

By Laurie Clarke
Illustrations by John Hersey
several research groups used chest scans to diagnose COVID-19. AI models trained on chest X-rays, computer tomography scans and other medical images to diagnose COVID-19 or predict patient risk. After closely examining 62 of these tools, the authors concluded that because of a high risk for bias or other methodological flaws, none was fit for clinical use. Another review, published in The BMJ, which examined models using any type of clinical input data (not just medical imaging), reached a similarly dim view of hundreds of newly minted diagnostic and prognostic tools for COVID.

Deep-learning algorithms have their proficiencies on an astronomical number of records, which must be clean and neatly labeled. Yet with COVID, deep wells of data that met the needed criteria—substantive, freely accessible and well formatted—have proved almost impossible to come by. Privacy rules have thrown up another barrier.

There’s also the laborious process of preparing the data. “If you’re trying to identify cancer in the lungs, for example, you need someone to manually annotate those images indicating the pixels that correspond to cancer,” says Franz. This makes collecting medical images costly and tedious, requiring the participation of radiologists as well as AI experts.

Without extensive reserves of meticulous patient records, the resulting AI model can be unpredictable or incomplete. For example, several research groups used chest scans of children not infected with COVID-19 to teach algorithms what non-COVID cases looked like. But instead of learning to identify who did or did not have COVID, the AI tools learned to identify children.

At the heart of the issue was “not having access to the desired data, or having data that were not suitably formatted or documented,” according to a 2021 report from the Alan Turing Institute, the United Kingdom’s national center for data science and AI. Yet even AI trained on images that are clean and neatly labeled may still face challenges in the field. In 2020, Google Health researchers tried out an AI diagnostic tool for diabetic retinopathy, a condition that affects people with diabetes and can cause blindness. In the laboratory, the tool worked with a data set of eye photographs and achieved 90% accuracy in diagnosing the condition. But in the real-world setting of 11 clinics in Thailand, the deep-learning system’s shortcomings became apparent. It frequently didn’t know what to make of photos of patients’ eyes snapped in poor lighting conditions and wasn’t able to make a diagnosis.

Synthetic data might help with many of these issues. By generating records that are in line with real human examples, it can produce an ample, well-annotated training database that may avoid privacy concerns. And synthetic data engines can be calibrated to produce a wider array of examples that reflect what AI tools are likely to encounter when meeting real-life data in the wild.

To produce synthetic data or images, a model known as a generative adversarial network, or GAN, is often used. As a first step, the GAN works with a deep set of real images and learns to produce data that is statistically similar. A neural network called the generator creates outputs—for example, photos of artificial faces—that are as realistic as possible. A second network, called the discriminator, compares those generated images with real examples in the training data and tries to decide whether they are genuine or fake. Based on that feedback, the generator tweaks its parameters for creating new images, continuing until the discriminator can no longer tell the difference between real and artificial.

Synthetic data generated in this way can produce more training images with greater variation, including examples on the margins of clarity that mirror real-world data. While the GAN approach is relatively new, researchers have already used it to create photorealistic synthetic data for skin lesions, pathology slides and chest X-rays. Early in the pandemic, a study carried out by researchers from the Maharaja Agrasen Institute of Technology in New Delhi created synthetic chest X-ray images of COVID-19 patients to supplement a scarce set of real radiographic images. They found that adding the synthetic images increased a diagnostic AI’s ability to detect patients who had COVID.

Philip Payne, founding director of the Institute for Informatics at Washington University in St. Louis, led a team that created what he believes to be the largest synthetic medical data set ever assembled. The set was based on data in the National COVID Cohort Collaborative (N3C), which pooled patient-level data representing 13 million patients from 72 institutions. The synthetic data mirrors the characteristics of the original subjects, but because of the way the set was created, its records do not correspond exactly to any real patients.

The techniques the researchers used represent one approach to using patient data sets without running into privacy concerns. The usual way to share patient records for research is to “de-identify” the patients, removing characteristics such as names, phone numbers and birth dates that could be used to join down a person’s identity. The Health Insurance Portability and Accountability Act, or HIPAA, includes a privacy rule that spells out many of these requirements. Some regulations were temporarily lifted during the pandemic, and sources such as the Open COVID-19 Data Curations Group, which collated international patient-level...
In Depth • Technology

Researchers needed elements of real patient data—neighborhoods in a city where COVID infection was highest, for example, or the dates when an infection had peaked. But raw data records that mirrored the situation accurately might work just as well as the real thing. To create the NSC data set, Payne’s team partnered with Israel-startup MDClone on a computational approach that takes detailed information—not only geographic information but also medical data including body mass index, kidney function and blood pressure—from the records of real patients. “You create new synthetic patients that are replicas of the source patients,” Payne says. “The individual measurements, while not identical, don’t have statistically significant differences.”

Payne’s team was excited by the prospect that this huge, national data set would enable the research team to undertake “really big, predictive analytics projects—such as trying to determine which COVID patients are at risk of requiring ventilator support and who is going to get very severe disease,” he says. “Researchers would have enough data to run large, effective clinical trials’ control arms and could speed subjects—are showing promise for population-level studies, which are different from clinical trials. The U.S. Food and Drug Administration has signed up for a multi-year collaboration with Merck KGaA, Germany, to accelerate late-stage clinical trials in immunology and perhaps other therapeutic areas. Unlearn has received a regulatory qualification from the European Medicines Agency that describes the applicability of synthetic data in medicine, noting the method’s current tent data problem and helping revolutionize the use of synthetic data, will help speed progress. For now, the quality of medical data lags behind data in other industries, but research demonstrates how much can be done even with substandard data—raising hopes for a future in which ever more sophisticated algorithms might finally crack medicine’s persistent data problem and help revolutionize medical AI.

DOSSIER

“Synthetic data in machine learning for medicine and healthcare,” by Richard J. Chen et al., Nature Biomedical Engineering, June 2021. The authors chart the growth of the synthetic data frontier in medicine, noting the method’s current limitations and potential regulatory hurdles as it gains wider adoption.

The National COVID Cohort Collaborative: Analyses of Original and Computationally Derived Electronic Health Record Data,” by Randi Foraker et al., The Journal of Medical Internet Research, October 2021. A synthetically derived national COVID-19 data set is run through a handful of use cases and is shown to successfully mimic data results from the real world.
When the World Health Organization declared COVID-19 a pandemic in March 2020, my profession moved to center stage. Science reporters like me had spent our careers helping people make sense of the world of research and medicine, and suddenly we faced a story that had the undivided attention of a global audience. It was all hands on deck. As medical professionals ran their own gauntlet of long hours and uncertainty, we also felt a sense of purpose and preparation for a role that would be tough and sometimes thankless in the months ahead.

Science writers are trained to understand complex facts, map out what’s known and what remains uncertain, and make all of it digestible for readers. “Science reporters help people understand reality in a way that captures the best knowledge of the moment,” says Scientific American editor-in-chief Laura Helmuth. As the pandemic took hold, our work was essential in helping a wide swath of the nonscientist public, including policymakers, grasp what was happening so that they could make informed decisions.

Our profession aims to help society navigate complex issues where science plays a role. It didn’t start with the pandemic, nor will it stop there. As the climate crisis hits home in the form of fires, floods and global heat waves, for instance, science reporters are tasked with explaining the forces behind these catastrophes without shortchanging the public skepticism has cast a shadow over medicine and those who report on it. Yet for both professions, the mission continues.

By CHRISTIE ASCHWANDEN // Illustrations by JIM TSINGANOS
The Pandemic That Wasn’t

Public conversations about transmissibility, vaccines and risk got a trial run in Proto’s launch issue.

For medical journalists, 2005 was the year of the avian flu. The highly lethal virus was believed to have killed more than 100 million birds, and in instances where it hopped over to human hosts, the flu killed six out of 10 people who were known to have contracted it. As the public tried to gauge their personal level of threat, some researchers had predicted human deaths in the millions—they were met with journalistic takes that, many in journalism, were tight on the risks and mechanisms of transmission and heavy on voices predicting the worst.

It was in this environment that Proto launched its fall 2005 debut issue. The magazine’s first cover feature did not dirroius the possibility of H5N1 developing into a pandemic, but focused instead on the events that could realistically trigger a public health disaster. The piece explored the “antigenic drift,” that creates new viral threats, as well as the specifics of H5N1, and its interaction with human hosts. For instance, the virus at that time had not been seen to colonize the human upper respiratory tract—a sign that, in its current form, both bird- to-animal transmission and human-to-human transmission remained unlikely. In a forshadowing of the COVID-19 pandemic, the article also highlighted the dangers of wet markets, places where live animals are sold for human consumption, calling them “the ideal conditions for viral evolution.”

This model of reporting on infectious disease, focusing on scientific questions and debates, would serve as the first training for Proto’s coverage of the COVID-19 pandemic nearly two decades later. The outbreak—which in the end resulted in a few hundred deaths globally—would also serve as a wake-up call for pandemic preparedness and the need for new vaccine models.

The Personal and the Political

In 2016, pediatric gender transition had not been widely covered. That would dramatically change.

Transgender identities are a pediatric issue, with two out of three transgender adults saying they first experienced gender dysphoria in childhood. The average age for having those feelings was 8. Over the past few years, the topic of medical treatment for these children has become a fraught—and politically embattled—conversation.

As of October 2022, more than a dozen state legislatures have proposed or enacted laws to limit gender-affirming medical care and penalize those who offer it. In Alabama, for instance, providing puberty blockers, hormones or medical procedures to those under 19 is now a felony punishable by up to 10 years in prison.

In 2020, national debates about transgender people had been confined to bathroom laws and participation in sports and the military. Proto was one of the first publications to explore the medical dimensions of gender dysphoria for youth. Nothing to do with politics but largely sidestepping these discussions, the article explored the evolving and incomplete landscape of research, as well as the conversations about these patients happening among endocrinologists and psychologists—all with an eye to giving these kids happy and well-adjusted lives.

The frontier was and remains complex, and it includes the ongoing question of how best to accommodate young patients who go through various gender identities before adulthood. With no apparent biomarkers, the general consensus was—and remains—to

explain the questions at stake and lay out the points of contention. But even when they do that, readers will sometimes take a balanced article and weaponize it on behalf of their own point of view.

Another recent lesson has been the importance—both to medicine and to the public—of questioning powerful voices. Around Thanksgiving in 2020, as people considered whether it was safe to gather with their families for the holiday, many state officials advised against it, asserting that small gatherings were driving this phase of the pandemic. But New York Times science and global health reporter Apoorva Mandavilli wasn’t convinced that small gatherings were the biggest problem. Statistics released by most states showed that it was primarily the complexities and unanswered questions that researchers continue to grapple with. Yet just when the need for good science writing is greater than ever, it is increasingly under attack. The explosion of social media, with its ecosystems of alternative news and disinformation, has made the public skeptical about, if not openly hostile to, the very notion of scientific fact and those who present it as such. The scientific consensus, told well, can trump politics.

When science writing does break through, it often does so by “telling” science in ways the human brain can more easily process. Narrating storytelling, for instance, sometimes does a better job of helping people grasp complex scientific information, a finding borne out by research into how public health agencies can convey the importance of vaccines. Where data can be cold, human stories can connect.

One very public lesson from the past few years has been how difficult it is to convey findings when there is conflict or disagreement among researchers. Yet this has always been part of the beat. In 2014, I wrote in Proto about the challenges of treating a breast condition called ductal carcinoma in situ. Emerging evidence suggested that this precancerous condition was being overtreated, with women receiving aggressive therapy they didn’t need, but experts disagreed about the extent of the problem and how to address it. The best way I have found to report on conflicting points of view is to look for where consensus exists, and draw on the events that could realistically trigger a public health disaster. The piece explored the “antigenic drift” that creates new viral threats, as well as the specifics of H5N1 and its interaction with human hosts. For instance, the virus at that time had not been seen to colonize the human upper respiratory tract—a sign that, in its current form, both bird- to-animal transmission and human-to-human transmission remained unlikely. In a forshadowing of the COVID-19 pandemic, the article also highlighted the dangers of wet markets, places where live animals are sold for human consumption, calling them “the ideal conditions for viral evolution.”

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“THIS WILL CHANGE EVERYTHING”

Medical innovations are cause for excitement. Voices of skepticism are also critical to invite in.

With the hindsight of almost two decades in print, it is clear that not every transformative innovation Proto covered will live up to its promise. That messy process of science is also worth reporting on.

In 2006, Proto turned its attention to NOTES—natural orifice transluminal endoscopic surgery. Surgeons would access abdominal organs through natural orifices, such as the mouth or anus, instead of making an incision in the muscles of the abdominal wall, which can account for much of in-hospital recovery time. A major paper showing the success of such surgeries in pigs had been published in 2004, and by 2006 the procedure was discussed as a potential boon for humans. The process would build on the success of endoscopic techniques and theoretically create fewer scars and complications.

While the story cited those who hailed NOTES as a leap in minimally invasive surgery, it also documented several informed objections—a practice built into Proto’s innovation coverage. Some commented that NOTES offered few advantages over laparoscopy, which was itself quickly advancing, and often commented the questionable practice of puncturing the stomach wall.

The first human instance of this surgery occurred in 2007, when a team in New York removed a patient’s gallbladder through her vaginal wall. Since then, however, the procedure has not been widely adopted.

In 2021, Proto interviewed neuroscientist Nicholas Holmes about the need for researchers to create “an honest list of disappointments”—a catalog of their ideas that haven’t been borne out by time. For Holmes, frankness about the indirect and sometimes disappointing byways of science is the only way to build trust with the public. climate change was an esteemed physicist commenting on science far outside his field.

Voices of skepticism are also critical to invite in. This responsibility also extends to fact-checking members of the medical field who might be speaking outside of their field or expertise or have conflicts of interest, says Amy Maxmen, a winner of the Victor Cohn Prize for Excellence in Medical Science Reporting in 2021. Some doctors with no training in infectious diseases have nevertheless felt free to opine on how COVID-19 spreads, what drugs should be used to treat it and whether vaccines have any value. The problem extends beyond medicine, as a leader of the movement to denounce human-made climate change was an esteemed physicist commenting on science far outside his field.

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One evening, my 84-year-old mother went to the dining hall of her senior residence and noticed a lanky man with a white mane. He was sitting all alone at one of the tables. "Are you waiting for anyone?" she asked him sweetly.

Over the next few hours, I received a flurry of photo texts from my mother’s caregiver, Maria. Two figures leaning into one another at the dining table. The two of them walking down a garden path in dappled twilight. And later, their heads bowed together, silhouetted against the glow of a movie screen in the facility’s small theater. A romance had blossomed.

My father had passed away two years before, and my mother had been craving male attention ever since. David quickly became my mother’s first new boyfriend in more than 50 years.

In those first days, my mother talked a lot about how much she loved to kiss David. They had found a secret spot where they could smooch. There turned out to be other upsides. Within a week, my mother, who has Parkinson’s, suddenly seemed sharper. Her sentences were more linear and connected to the world around her, and her memory was more lucid. She walked with greater confidence, too, each step forward like a tiny conquest rather than a timid retreat. The difference even showed up on a cognitive test administered by her neurologist—it was as though six months of dramatic cognitive decline had been erased, she said.

Was romance the medicine my mom really needed? Since her diagnosis in 2014, it had been hard not to see the emotional component in the progression of her condition. Her cognition declined sharply after my father’s death, and again when she moved out of her home into a retirement community in 2021. Yet love, as it often does, brought thorns as well as roses. I soon found out that David encouraged my mother to refuse her meds and to ditch her walker, which she needs for balance. He urged her to get rid of her Foley catheter so that they could have sex. He sometimes barked at her to hurry up or made fun of other residents with ailments and disabilities, an attitude that led my mother to have anxiety attacks and debilitating stomach pains.

David also insulted the caregivers and made them wait outside my mother’s room when he visited. I began trying to set some boundaries with him, for her safety, but while David made promises, he ignored every one of them. Eventually, he was called out by the resident services manager and required to stop visiting my mother’s apartment. He promptly dropped contact with her.

Within a week, it was as if my mother’s life force had been strangled out of her. She couldn’t get out of bed or her chair without a lot of help. She needed a wheelchair to travel any distance. Her voice became a whisper. The cause was obvious, but I had a hard time understanding how heartbreak could lead to such a profound response. The neurologist was puzzled by her sudden regression until I mentioned the saga of the boyfriend. “Ah,” she said, her eyes getting big. “When we get to this age, the connection between the emotional and the physical can be dramatic.”

Over the following month, my mother slowly regained her strength and her cognition recovered somewhat. But the effects of that first fire, which lit her up and put her in such good health, have not returned.

I had not expected my mother’s romantic life to play a part in my adult caregiving, but it is just one more wrinkle in the reversal of our roles. One day I decided to ask her: Were those kisses in their hidden nook worth all the trouble? She tells me that, overall, she believes she is better off without David, but she has no regrets.
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