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THE NEW YORKER

ANNALS OF MEDICINE

SLOW IDEAS

Some innovations spread fast. How do you speed the ones that don't?

by Atul Gawande

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Why do some innovations spread so swiftly and others so slowly? Consider the very different trajectories of surgical anesthesia and antiseptics, both of which were discovered in the nineteenth century. The first public demonstration of anesthesia was in 1846. The Boston surgeon Henry Jacob Bigelow was approached by a local dentist named William Morton, who insisted that he had found a gas that could render patients insensible to the pain of surgery. That was a dramatic claim. In those days, even a minor tooth extraction was excruciating. Without effective pain control, surgeons learned to work with slashing speed. Attendants pinned patients down as they screamed and thrashed, until they fainted from the agony. Nothing ever tried had made much difference. Nonetheless, Bigelow agreed to let Morton demonstrate his claim.

We yearn for frictionless, technological solutions. But people talking to people is still the way that norms and standards change. Illustration by Harry Campbell.

On October 16, 1846, at Massachusetts General Hospital, Morton administered his gas through an inhaler in the mouth of a young man undergoing the excision of a tumor in his jaw. The patient only muttered to himself in a semi-conscious state during the procedure. The following day, the gas left a woman, undergoing surgery to cut a large tumor from her upper arm, completely silent and motionless. When she woke, she said she had experienced nothing at all.

Four weeks later, on November 18th, Bigelow published his report on the discovery of "insensibility produced by inhalation" in the *Boston Medical and Surgical Journal*. Morton would not divulge the composition of the gas, which he called Letheon, because he had applied for a patent. But Bigelow reported that he smelled ether in it (ether was used as an ingredient in certain medical preparations), and that seems to have been enough. The idea spread like a contagion, travelling through letters, meetings, and periodicals. By mid-December, surgeons were administering ether to patients in Paris and London. By February, anesthesia had been used in almost all the capitals of Europe, and by June in most regions of the world.

There were forces of resistance, to be sure. Some people criticized anesthesia as a "needless luxury"; clergymen deplored its use to reduce pain during childbirth as a frustration of the Almighty's designs. James Miller, a nineteenth-century Scottish surgeon who chronicled the advent of anesthesia, observed the opposition of elderly surgeons: "They closed their ears, shut their eyes, and folded their hands. . . . They had quite made up their minds that pain was a necessary evil, and must be endured." Yet soon even the obstructors, "with a run, mounted behind—hurrahing and shouting with the best." Within seven years, virtually every hospital in America and Britain had adopted the new discovery.

Sepsis—infection—was the other great scourge of surgery. It was the single biggest killer of surgical patients, claiming as many as half of those who underwent major operations, such as a repair of an open fracture or the amputation of a limb. Infection was so prevalent that suppuration—the discharge of pus from a surgical wound—was thought to be a necessary part of healing.

In the eighteen-sixties, the Edinburgh surgeon Joseph Lister read a paper by Louis Pasteur laying out his evidence that spoiling and fermentation were the consequence of microorganisms. Lister became convinced that the same process accounted for wound sepsis. Pasteur had observed that, besides filtration and the application of heat, exposure to certain chemicals could eliminate germs. Lister had read about the city of Carlisle's success in using a small amount of carbolic acid to eliminate the odor of sewage, and reasoned that it was destroying germs. Maybe it could do the same in surgery.

During the next few years, he perfected ways to use carbolic acid for cleansing hands and wounds and destroying any germs that might enter the operating field. The result was strikingly

lower rates of sepsis and death. You would have thought that, when he published his observations in a groundbreaking series of reports in *The Lancet*, in 1867, his antiseptic method would have spread as rapidly as anesthesia.

Far from it. The surgeon J. M. T. Finney recalled that, when he was a trainee at Massachusetts General Hospital two decades later, hand washing was still perfunctory. Surgeons soaked their instruments in carbolic acid, but they continued to operate in black frock coats stiffened with the blood and viscera of previous operations—the badge of a busy practice. Instead of using fresh gauze as sponges, they reused sea sponges without sterilizing them. It was a generation before Lister's recommendations became routine and the next steps were taken toward the modern standard of asepsis—that is, entirely excluding germs from the surgical field, using heat-sterilized instruments and surgical teams clad in sterile gowns and gloves.

In our era of electronic communications, we've come to expect that important innovations will spread quickly. Plenty do: think of in-vitro fertilization, genomics, and communications technologies themselves. But there's an equally long list of vital innovations that have failed to catch on. The puzzle is why.

Did the spread of anesthesia and antisepsis differ for economic reasons? Actually, the incentives for both ran in the right direction. If painless surgery attracted paying patients, so would a noticeably lower death rate. Besides, live patients were more likely to make good on their surgery bill. Maybe ideas that violate prior beliefs are harder to embrace. To nineteenth-century surgeons, germ theory seemed as illogical as, say, Darwin's theory that human beings evolved from primates. Then again, so did the idea that you could inhale a gas and enter a pain-free state of suspended animation. Proponents of anesthesia overcame belief by encouraging surgeons to try ether on a patient and witness the results for themselves—to take a test drive. When Lister tried this strategy, however, he made little progress.

The technical complexity might have been part of the difficulty. Giving Lister's methods "a try" required painstaking attention to detail. Surgeons had to be scrupulous about soaking their hands, their instruments, and even their catgut sutures in antiseptic solution. Lister also set up a device that continuously sprayed a mist of antiseptic over the surgical field.

But anesthesia was no easier. Obtaining ether and constructing the inhaler could be difficult. You had to make sure that the device delivered an adequate dosage, and the mechanism required constant tinkering. Yet most surgeons stuck with it—or else they switched to chloroform, which was found to be an even more powerful anesthetic, but posed its own problems. (An imprecise dosage killed people.) Faced with the complexities, they didn't give up; instead, they formed an entire new medical specialty—anesthesiology.

So what were the key differences? First, one combatted a visible and immediate problem (pain); the other combatted an invisible problem (germs) whose effects wouldn't be manifest

until well after the operation. Second, although both made life better for patients, only one made life better for doctors. Anesthesia changed surgery from a brutal, time-pressured assault on a shrieking patient to a quiet, considered procedure. Listerism, by contrast, required the operator to work in a shower of carbolic acid. Even low dilutions burned the surgeons' hands. You can imagine why Lister's crusade might have been a tough sell.

This has been the pattern of many important but stalled ideas. They attack problems that are big but, to most people, invisible; and making them work can be tedious, if not outright painful. The global destruction wrought by a warming climate, the health damage from our over-sugared modern diet, the economic and social disaster of our trillion dollars in unpaid student debt—these things worsen imperceptibly every day. Meanwhile, the carbolic-acid remedies to them, all requiring individual sacrifice of one kind or another, struggle to get anywhere.

The global problem of death in childbirth is a pressing example. Every year, three hundred thousand mothers and more than six million children die around the time of birth, largely in poorer countries. Most of these deaths are due to events that occur during or shortly after delivery. A mother may hemorrhage. She or her baby may suffer an infection. Many babies can't take their first breath without assistance, and newborns, especially those born small, have trouble regulating their body temperature after birth. Simple, lifesaving solutions have been known for decades. They just haven't spread.

Many solutions aren't ones you can try at home, and that's part of the problem. Increasingly, however, women around the world are giving birth in hospitals. In India, a government program offers mothers up to fourteen hundred rupees—more than what most Indians live on for a month—when they deliver in a hospital, and now, in many areas, the majority of births are in facilities. Death rates in India have fallen, but they're still ten times greater than in high-income countries like our own.

Not long ago, I visited a few community hospitals in north India, where just one-third of mothers received the medication recommended to prevent hemorrhage; less than ten per cent of the newborns were given adequate warming; and only four per cent of birth attendants washed their hands for vaginal examination and delivery. In an average childbirth, clinicians followed only about ten of twenty-nine basic recommended practices.

Here we are in the first part of the twenty-first century, and we're still trying to figure out how to get ideas from the first part of the twentieth century to take root. In the hopes of spreading safer childbirth practices, several colleagues and I have teamed up with the Indian government, the World Health Organization, the Gates Foundation, and Population Services International to create something called the BetterBirth Project. We're working in Uttar Pradesh, which is among India's poorest states. One afternoon in January, our team travelled a couple of hours from the state's capital, Lucknow, with its bleating cars and ramshackle shops,

to a rural hospital surrounded by lush farmland and thatched-hut villages. Although the sun was high and the sky was clear, the temperature was near freezing. The hospital was a one-story concrete building painted goldenrod yellow. (Our research agreement required that I keep it unnamed.) The entrance is on a dirt road lined with rows of motorbikes, the primary means of long-distance transportation. If an ambulance or an auto-rickshaw can't be found, women in labor sit sidesaddle on the back of a bike.

The hospital delivers three thousand newborns a year, a typical volume in India but one that would put it in the top fifth of American hospitals. Yet it had little of the amenities that you'd associate with a modern hospital. I met the physician in charge, a smart and capable internist in his early thirties who had trained in the capital. He was clean-shaven and buzz-cut, with an Argyle sweater, track shoes, and a habitual half smile. He told me, apologetically, that the hospital staff had no ability to do blood tests, to give blood transfusions, or to perform emergency obstetrics procedures such as Cesarean sections. There was no electricity during the day. There was certainly no heating, even though the temperature was barely forty degrees that day, and no air-conditioning, even though summer temperatures routinely reach a hundred degrees. There were two blood-pressure cuffs for the entire facility. The nurse's office in my neighborhood elementary school was better equipped.

The hospital was severely understaffed, too. The doctor said that half of the staff positions were vacant. To help with child deliveries for a local population of a quarter of a million people, the hospital had two nurses and one obstetrician, who happened to be his wife. The nurses, who had six months of childbirth training, did most of the deliveries, swapping shifts year-round. The obstetrician covered the outpatient clinic, and helped with complicated births whenever she was required, day or night. During holidays or sickness, the two nurses covered for each other, but, if no one was available, laboring women were either sent to another hospital, miles away, or an untrained assistant might be forced to step in.

It may be surprising that mothers are better off delivering in such places than at home in a village, but studies show a consistently higher survival rate when they do. The staff members I met in India had impressive experience. Even the youngest nurses had done more than a thousand child deliveries. They've seen and learned to deal with countless problems—a torn placenta, an umbilical cord wrapped around a baby's neck, a stuck shoulder. Seeing the daily heroism required to keep such places going, you feel foolish and ill-mannered asking how they could do things better.

But then we hung out in the wards for a while. In the delivery room, a boy had just been born. He and his mother were lying on a cot, bundled under woollen blankets, resting. The room was coffin-cold; I was having trouble feeling my toes. I tried to imagine what that baby must have felt like. Newborns have a high body-surface area and lose heat rapidly. Even in warm

weather, hypothermia is common, and it makes newborns weak and less responsive, less able to breast-feed adequately and more prone to infection. I noticed that the boy was swaddled separately from his mother. Voluminous evidence shows that it is far better to place the child on the mother's chest or belly, skin to skin, so that the mother's body can regulate the baby's until it is ready to take over. Among small or premature babies, kangaroo care (as it is known) cuts mortality rates by a third.

So why hadn't the nurse swaddled the two together? She was a skilled and self-assured woman in her mid-thirties with twinkly eyes, a brown knit hat, and a wool sweater over her shalwar kameez. Resources clearly weren't the issue—kangaroo care costs nothing. Had she heard of it? Oh, yes, she said. She'd taken a skilled-birth-attendant class that taught it. Had she forgotten about it? No. She had actually offered to put the baby skin to skin with the mother, and showed me where she'd noted this in the record.

"The mother didn't want it," she explained. "She said she was too cold."

The nurse seemed to think it was strange that I was making such an issue of this. The baby was fine, wasn't he? And he was. He was sleeping sweetly, a tightly wrapped peanut with a scrunched brown face and his mouth in a lowercase "o."

But had his temperature been taken? It had not. The nurse said that she had been planning to do so. Our visit had disrupted her routine. Suppose she had, though, and his temperature was low. Would she have done anything differently? Would she have made the mom unswaddle the child and put him to her chest?

Everything about the life the nurse leads—the hours she puts in, the circumstances she endures, the satisfaction she takes in her abilities—shows that she cares. But hypothermia, like the germs that Lister wanted surgeons to battle, is invisible to her. We picture a blue child, suffering right before our eyes. That is not what hypothermia looks like. It is a child who is just a few degrees too cold, too sluggish, too slow to feed. It will be some time before the baby begins to lose weight, stops making urine, develops pneumonia or a bloodstream infection. Long before that happens—usually the morning after the delivery, perhaps the same night—the mother will have hobbled to an auto-rickshaw, propped herself beside her husband, held her new baby tight, and ridden the rutted roads home.

From the nurse's point of view, she'd helped bring another life into the world. If four per cent of the newborns later died at home, what could that possibly have to do with how she wrapped the mother and child? Or whether she washed her hands before putting on gloves? Or whether the blade with which she cut the umbilical cord was sterilized?

We're infatuated with the prospect of technological solutions to these problems—baby warmers, say. You can still find high-tech incubators in rural hospitals that sit mothballed because a replacement part wasn't available, or because there was no electricity for them. In

recent years, though, engineers have produced designs specifically for the developing world. Dr. Steven Ringer, a neonatologist and BetterBirth leader, was an adviser for a team that made a cheap, ingenious, award-winning incubator from old car parts that are commonly available and easily replaced in low-income environments. Yet it hasn't taken off, either. "It's in more museums than delivery rooms," he laments.

As with most difficulties in global health care, lack of adequate technology is not the biggest problem. We already have a great warming technology: a mother's skin. But even in high-income countries we do not consistently use it. In the United States, according to Ringer, more than half of newborns needing intensive care arrive hypothermic. Preventing hypothermia is a perfect example of an unsexy task: it demands painstaking effort without immediate reward. Getting hospitals and birth attendants to carry out even a few of the tasks required for safer childbirth would save hundreds of thousands of lives. But how do we do that?

The most common approach to changing behavior is to say to people, "Please do X." Please warm the newborn. Please wash your hands. Please follow through on the twenty-seven other childbirth practices that you're not doing. This is what we say in the classroom, in instructional videos, and in public-service campaigns, and it works, but only up to a point.

Then, there's the law-and-order approach: "You must do X." We establish standards and regulations, and threaten to punish failures with fines, suspensions, the revocation of licenses. Punishment can work. Behavioral economists have even quantified how averse people are to penalties. In experimental games, they will often quit playing rather than risk facing negative consequences. And that is the problem with threatening to discipline birth attendants who are taking difficult-to-fill jobs under intensely trying conditions. They'll quit.

The kinder version of "You must do X" is to offer incentives rather than penalties. Maybe we could pay birth attendants a bonus for every healthy child who makes it past a week of life. But then you think about how hard it would be to make a scheme like that work, especially in poor settings. You'd need a sophisticated tracking procedure, to make sure that people aren't gaming the system, and complex statistical calculations, to take prior risks into account. There's also the impossible question of how you split the reward among all the people involved. How much should the community health worker who provided the prenatal care get? The birth attendant who handled the first twelve hours of labor? The one who came on duty and handled the delivery? The doctor who was called in when things got complicated? The pharmacist who stocked the antibiotic that the child required?

Besides, neither penalties nor incentives achieve what we're really after: a system and a culture where X is what people do, day in and day out, even when no one is watching. "You must" rewards mere compliance. Getting to "X is what we do" means establishing X as the

norm. And that's what we want: for skin-to-skin warming, hand washing, and all the other lifesaving practices of childbirth to be, quite simply, the norm.

To create new norms, you have to understand people's existing norms and barriers to change. You have to understand what's getting in their way. So what about just working with health-care workers, one by one, to do just that? With the BetterBirth Project, we wondered, in particular, what would happen if we hired a cadre of childbirth-improvement workers to visit birth attendants and hospital leaders, show them why and how to follow a checklist of essential practices, understand their difficulties and objections, and help them practice doing things differently. In essence, we'd give them mentors.

The experiment is just getting under way. The project has recruited only the first few of a hundred or so workers whom we are sending out to hospitals across six regions of Uttar Pradesh in a trial that will involve almost two hundred thousand births over two years. There's no certainty that our approach will succeed. But it seemed worth trying.

Reactions that I've heard both abroad and at home have been interestingly divided. The most common objection is that, even if it works, this kind of one-on-one, on-site mentoring "isn't scalable." But that's one thing it surely is. If the intervention saves as many mothers and newborns as we're hoping—about a thousand lives in the course of a year at the target hospitals—then all that need be done is to hire and develop similar cadres of childbirth-improvement workers for other places around the country and potentially the world. To many people, that doesn't sound like much of a solution. It would require broad mobilization, substantial expense, and perhaps even the development of a new profession. But, to combat the many antisepsis-like problems in the world, that's exactly what has worked. Think about the creation of anesthesiology: it meant doubling the number of doctors in every operation, and we went ahead and did so. To reduce illiteracy, countries, starting with our own, built schools, trained professional teachers, and made education free and compulsory for all children. To improve farming, governments have sent hundreds of thousands of agriculture extension agents to visit farmers across America and every corner of the world and teach them up-to-date methods for increasing their crop yields. Such programs have been extraordinarily effective. They have cut the global illiteracy rate from one in three adults in 1970 to one in six today, and helped give us a Green Revolution that saved more than a billion people from starvation.

In the era of the iPhone, Facebook, and Twitter, we've become enamored of ideas that spread as effortlessly as ether. We want frictionless, "turnkey" solutions to the major difficulties of the world—hunger, disease, poverty. We prefer instructional videos to teachers, drones to troops, incentives to institutions. People and institutions can feel messy and anachronistic. They introduce, as the engineers put it, uncontrolled variability.

But technology and incentive programs are not enough. "Diffusion is essentially a social process through which people talking to people spread an innovation," wrote Everett Rogers, the great scholar of how new ideas are communicated and spread. Mass media can introduce a new idea to people. But, Rogers showed, people follow the lead of other people they know and trust when they decide whether to take it up. Every change requires effort, and the decision to make that effort is a social process.

This is something that salespeople understand well. I once asked a pharmaceutical rep how he persuaded doctors—who are notoriously stubborn—to adopt a new medicine. Evidence is not remotely enough, he said, however strong a case you may have. You must also apply "the rule of seven touches." Personally "touch" the doctors seven times, and they will come to know you; if they know you, they might trust you; and, if they trust you, they will change. That's why he stocked doctors' closets with free drug samples in person. Then he could poke his head around the corner and ask, "So how did your daughter Debbie's soccer game go?" Eventually, this can become "Have you seen this study on our new drug? How about giving it a try?" As the rep had recognized, human interaction is the key force in overcoming resistance and speeding change.

In 1968, *The Lancet* published the results of a modest trial of what is now regarded as among the most important medical advances of the twentieth century. It wasn't a new drug or vaccine or operation. It was basically a solution of sugar, salt, and water that you could make in your kitchen. The researchers gave the solution to victims of a cholera outbreak in Dhaka, the capital of what is now Bangladesh, and the results were striking.

Cholera is a violent and deadly diarrheal illness, caused by the bacterium *Vibrio cholera*, which the victim usually ingests from contaminated water. The bacteria secrete a toxin that triggers a rapid outpouring of fluid into the intestine. The body, which is sixty per cent water, becomes like a sponge being wrung out. The fluid pouring out is a cloudy white, likened to the runoff of washed rice. It produces projectile vomiting and explosive diarrhea. Children can lose a third of their body's water in less than twenty-four hours, a fatal volume. Drinking water to replace the fluid loss is ineffective, because the intestine won't absorb it. As a result, mortality commonly reached seventy per cent or higher. During the nineteenth century, cholera pandemics killed millions across Asia, Europe, Africa, and North America. The disease was dubbed the Blue Death because of the cyanotic blue-gray color of the skin from extreme dehydration.

In 1906, a partially effective treatment was found: intravenous fluid solutions reduced mortality to thirty per cent. Prevention was the most effective approach. Modern sewage and water treatment eliminated the disease in affluent countries. Globally, though, millions of children continued to die from diarrheal illness each year. Even if victims made it to a medical

facility, the needles, plastic tubing, and litres of intravenous fluid required for treatment were expensive, in short supply, and dependent on medical workers who were themselves in short supply, especially in outbreaks that often produced thousands of victims.

Then, in the nineteen-sixties, scientists discovered that sugar helps the gut absorb fluid. Two American researchers, David Nalin and Richard Cash, were in Dhaka during a cholera outbreak. They decided to test the scientific findings, giving victims an oral rehydration solution containing sugar as well as salt. Many people doubted that victims could drink enough of it to restore their fluid losses, typically ten to twenty litres a day. So the researchers confined the Dhaka trial to twenty-nine patients. The subjects proved to have no trouble drinking enough to reduce or even eliminate the need for intravenous fluids, and none of them died.

Three years later, in 1971, an Indian physician named Dilip Mahalanabis was directing medical assistance at a West Bengal camp of three hundred and fifty thousand refugees from Bangladesh's war of independence when cholera struck. Intravenous-fluid supplies ran out. Mahalanabis instructed his team to try the Dhaka solution. Just 3.6 per cent died, an unprecedented reduction from the usual thirty per cent. The solution was actually better than intravenous fluids. If cholera victims were alert, able to drink, and supplied with enough of it, they could almost always save their own lives.

One might have expected people to clamor for the recipe after these results were publicized. Oral rehydration solution seems like ether: a miraculous fix for a vivid, immediate, and terrifying problem. But it wasn't like ether at all.

To understand why, you have to imagine having a child throwing up and pouring out diarrhea like you've never seen before. Making her drink seems only to provoke more vomiting. Chasing the emesis and the diarrhea seems both torturous and futile. Many people's natural inclination is to not feed the child anything.

Furthermore, why believe that this particular mixture of sugar and salt would be any different from water or anything else you might have tried? And it *is* particular. Throw the salt concentration off by a couple of teaspoons and the electrolyte imbalance could be dangerous. The child must also keep drinking the stuff even after she feels better, for as long as the diarrhea lasts, which is up to five days. Nurses routinely got these steps wrong. Why would villagers do any better?

A decade after the landmark findings, the idea remained stalled. Nothing much had changed. Diarrheal disease remained the world's biggest killer of children under the age of five.

In 1980, however, a Bangladeshi nonprofit organization called BRAC decided to try to get oral rehydration therapy adopted nationwide. The campaign required reaching a mostly illiterate population. The most recent public-health campaign—to teach family planning—had been deeply unpopular. The messages the campaign needed to spread were complicated.

Nonetheless, the campaign proved remarkably successful. A gem of a book published in Bangladesh, "A Simple Solution," tells the story. The organization didn't launch a mass-media campaign—only twenty per cent of the population had a radio, after all. It attacked the problem in a way that is routinely dismissed as impractical and inefficient: by going door to door, person by person, and just talking.

It started with a pilot project that set out to reach some sixty thousand women in six hundred villages. The logistics were daunting. Who, for instance, would do the teaching? How were those workers going to travel? How was their security to be assured? The BRAC leaders planned the best they could and then made adjustments on the fly.

They recruited teams of fourteen young women, a cook, and a male supervisor, figuring that the supervisor would protect them from others as they travelled, and the women's numbers would protect them from the supervisor. They travelled on foot, pitched camp near each village, fanned out door to door, and stayed until they had talked to women in every hut. They worked long days, six days a week. Each night after dinner, they held a meeting to discuss what went well and what didn't and to share ideas on how to do better. Leaders periodically debriefed them, as well.

The workers were only semi-literate, but they helped distill their sales script into seven easy -to-remember messages: for instance, severe diarrhea leads to death from dehydration; the signs of dehydration include dry tongue, sunken eyes, thirst, severe weakness, and reduced urination; the way to treat dehydration is to replace salt and water lost from the body, starting with the very first loose stool; a rehydration solution provides the most effective way to do this. BRAC's scientists had to figure out how the workers could teach the recipe for the solution. Villagers had no precise measuring implements—spoons were locally made in nonstandard sizes. The leaders considered issuing special measuring spoons with the recipe on the handle. But these would be costly; most people couldn't read the recipe; and how were the spoons to be replaced when lost? Eventually, the team hit upon using finger measures: a fistful of raw sugar plus a three-finger pinch of salt mixed in half a "seer" of water—a pint measure commonly used by villagers when buying milk and oil. Tests showed that mothers could make this with sufficient accuracy.

Initially, the workers taught up to twenty mothers per day. But monitors visiting the villages a few weeks later found that the quality of teaching suffered on this larger scale, so the workers were restricted to ten households a day. Then a new salary system was devised to pay each worker according to how many of the messages the mothers retained when the monitor followed up. The quality of teaching improved substantially. The field workers soon realized that having the mothers make the solution themselves was more effective than just showing them. The workers began looking for diarrhea cases when they arrived in a village, and treating

them to show how effective and safe the remedy was. The scientists also investigated various questions that came up, such as whether clean water was required. (They found that, although boiled water was preferable, contaminated water was better than nothing.)

Early signs were promising. Mothers seemed to retain the key messages. Analysis of their sugar solutions showed that three-quarters made them properly, and just four in a thousand had potentially unsafe salt levels. So BRAC and the Bangladeshi government took the program nationwide. They hired, trained, and deployed thousands of workers region by region. The effort was, inevitably, imperfect. But, by going door to door through more than seventy-five thousand villages, they showed twelve million families how to save their children.

The program was stunningly successful. Use of oral rehydration therapy skyrocketed. The knowledge became self-propagating. The program had changed the norms.

Coaxing villagers to make the solution with their own hands and explain the messages in their own words, while a trainer observed and guided them, achieved far more than any public-service ad or instructional video could have done. Over time, the changes could be sustained with television and radio, and the growth of demand led to the development of a robust market for manufactured oral rehydration salt packets. Three decades later, national surveys have found that almost ninety per cent of children with severe diarrhea were given the solution. Child deaths from diarrhea plummeted more than eighty per cent between 1980 and 2005.

As other countries adopted Bangladesh's approach, global diarrheal deaths dropped from five million a year to two million, despite a fifty-per-cent increase in the world's population during the past three decades. Nonetheless, only a third of children in the developing world receive oral rehydration therapy. Many countries tried to implement at arm's length, going "low touch," without sandals on the ground. As a recent study by the Gates Foundation and the University of Washington has documented, those countries have failed almost entirely. People talking to people is still how the world's standards change.

Surgeons finally did upgrade their antiseptic standards at the end of the nineteenth century. But, as is often the case with new ideas, the effort required deeper changes than anyone had anticipated. In their blood-slick, viscera-encrusted black coats, surgeons had seen themselves as warriors doing hemorrhagic battle with little more than their bare hands. A few pioneering Germans, however, seized on the idea of the surgeon as scientist. They traded in their black coats for pristine laboratory whites, refashioned their operating rooms to achieve the exacting sterility of a bacteriological lab, and embraced anatomic precision over speed.

The key message to teach surgeons, it turned out, was not how to stop germs but how to think like a laboratory scientist. Young physicians from America and elsewhere who went to Germany to study with its surgical luminaries became fervent converts to their thinking and their standards. They returned as apostles not only for the use of antiseptic practice (to kill

germs) but also for the much more exacting demands of aseptic practice (to prevent germs), such as wearing sterile gloves, gowns, hats, and masks. Proselytizing through their own students and colleagues, they finally spread the ideas worldwide.

In childbirth, we have only begun to accept that the critical practices aren't going to spread themselves. Simple "awareness" isn't going to solve anything. We need our sales force and our seven easy-to-remember messages. And in many places around the world the concerted, person-by-person effort of changing norms is under way.

I recently asked BetterBirth workers in India whether they'd yet seen a birth attendant change what she does. Yes, they said, but they've found that it takes a while. They begin by providing a day of classroom training for birth attendants and hospital leaders in the checklist of practices to be followed. Then they visit them on site to observe as they try to apply the lessons.

Sister Seema Yadav, a twenty-four-year-old, round-faced nurse three years out of school, was one of the trainers. (Nurses are called "sisters" in India, a carryover from the British usage.) Her first assignment was to follow a thirty-year-old nurse with vastly more experience than she had. Watching the nurse take a woman through labor and delivery, she saw how little of the training had been absorbed. The room had not been disinfected; blood from a previous birth remained in a bucket. When the woman came in—moaning, contractions speeding up—the nurse didn't check her vital signs. She didn't wash her hands. She prepared no emergency supplies. After delivery, she checked the newborn's temperature with her hand, not a thermometer. Instead of warming the baby against the mother's skin, she handed the newborn to the relatives.

When Sister Seema pointed out the discrepancy between the teaching and the practice, the nurse was put out. She gave many reasons that steps were missed—there was no time, they were swamped with deliveries, there was seldom a thermometer at hand, the cleaners never did their job. Sister Seema—a cheerful, bubbly, fast talker—took her to the cleaner on duty and together they explained why cleaning the rooms between deliveries was so important. They went to the medical officer in charge and asked for a thermometer to be supplied. At her second and third visits, disinfection seemed more consistent. A thermometer had been found in a storage closet. But the nurse still hadn't changed much of her own routine.

By the fourth or fifth visit, their conversations had shifted. They shared cups of chai and began talking about why you must wash hands even if you wear gloves (because of holes in the gloves and the tendency to touch equipment without them on), and why checking blood pressure matters (because hypertension is a sign of eclampsia, which, when untreated, is a common cause of death among pregnant women). They learned a bit about each other, too. Both turned out to have one child—Sister Seema a four-year-old boy, the nurse an eight-year-old girl. The nurse lived in the capital, a two-hour bus ride away. She was divorced, living with her

mother, and struggled with the commute. She'd been frustrated not to find a hospital posting in the city. She worked for days at a stretch, sleeping on a cot when she got a break. Sister Seema commiserated, and shared her own hopes for her family and her future. With time, it became clearer to the nurse that Sister Seema was there only to help and to learn from the experience herself. They even exchanged mobile-phone numbers and spoke between visits. When Sister Seema didn't have the answer to a question, she made sure she got one.

Soon, she said, the nurse began to change. After several visits, she was taking temperatures and blood pressures properly, washing her hands, giving the necessary medications—almost everything. Sister Seema saw it with her own eyes.

She'd had to move on to another pilot site after that, however. And although the project is tracking the outcomes of mothers and newborns, it will be a while before we have enough numbers to know if a difference has been made. So I got the nurse's phone number and, with a translator to help with the Hindi, I gave her a call.

It had been four months since Sister Seema's visit ended. I asked her whether she'd made any changes. Lots, she said.

"What was the most difficult one?" I asked.

"Washing hands," she said. "I have to do it so many times!"

"What was the easiest?"

"Taking the vital signs properly." Before, she said, "we did it haphazardly." Afterward, "everything became much more systematic."

She said that she had eventually begun to see the effects. Bleeding after delivery was reduced. She recognized problems earlier. She rescued a baby who wasn't breathing. She diagnosed eclampsia in a mother and treated it. You could hear her pride as she told her stories.

Many of the changes took practice for her, she said. She had to learn, for instance, how to have all the critical supplies—blood-pressure cuff, thermometer, soap, clean gloves, baby respiratory mask, medications—lined up and ready for when she needed them; how to fit the use of them into her routine; how to convince mothers and their relatives that the best thing for a child was to be bundled against the mother's skin. But, step by step, Sister Seema had helped her to do it. "She showed me how to get things done practically," the nurse said.

"Why did you listen to her?" I asked. "She had only a fraction of your experience."

In the beginning, she didn't, the nurse admitted. "The first day she came, I felt the workload on my head was increasing." From the second time, however, the nurse began feeling better about the visits. She even began looking forward to them.

"Why?" I asked.

All the nurse could think to say was "She was nice."

"She was nice?"

"She smiled a lot."

"That was it?"

"It wasn't like talking to someone who was trying to find mistakes," she said. "It was like talking to a friend."

That, I think, was the answer. Since then, the nurse had developed her own way of explaining why newborns needed to be warmed skin to skin. She said that she now tells families, "Inside the uterus, the baby is very warm. So when the baby comes out it should be kept very warm. The mother's skin does this."

I hadn't been sure if she was just telling me what I wanted to hear. But when I heard her explain how she'd put her own words to what she'd learned, I knew that the ideas had spread. "Do the families listen?" I asked.

"Sometimes they don't," she said. "Usually, they do." ♦

THE NEW YORKER

The Hot Spotters

Can we lower medical costs by giving the neediest patients better care?

by Atul Gawande January 24, 2011

If Camden, New Jersey, becomes the first American community to lower its medical costs, it will have a murder to thank. At nine-fifty on a February night in 2001, a twenty-two-year-old black man was shot while driving his Ford Taurus station wagon through a neighborhood on the edge of the Rutgers University campus. The victim lay motionless in the street beside the open door on the driver's side, as if the car had ejected him. A neighborhood couple, a physical therapist and a volunteer firefighter, approached to see if they could help, but police waved them back.

"He's not going to make it," an officer reportedly told the physical therapist. "He's pretty much dead." She called a physician, Jeffrey Brenner, who lived a few doors up the street, and he ran to the scene with a stethoscope and a pocket ventilation mask. After some discussion, the police let him enter the

crime scene and attend to the victim. Witnesses told the local newspaper that he was the first person to lay hands on the man.

"He was slightly overweight, turned on his side," Brenner recalls. There was glass everywhere. Although the victim had been shot several times and many minutes had passed, his body felt warm. Brenner checked his neck for a carotid pulse. The man was alive. Brenner began the chest compressions and rescue breathing that should have been started long before. But the young man, who turned out to be a Rutgers student, died soon afterward.

The incident became a local scandal. The student's injuries may not have been survivable, but the police couldn't have known that. After the ambulance came, Brenner confronted one of the officers to ask why they hadn't tried to rescue him.

"We didn't want to dislodge the bullet," he recalls the policeman saying. It was a ridiculous answer, a brushoff, and Brenner couldn't let it go.

He was thirty-one years old at the time, a skinny, thick-bearded, soft-spoken family physician who had grown up in a bedroom suburb of Philadelphia. As a medical student at Robert Wood Johnson Medical School, in Piscataway, he had planned to become a neuroscientist. But he volunteered once a week in a free primary-care clinic for poor immigrants, and he found the work there more challenging than anything he was doing in the laboratory. The guy studying neuronal stem cells soon became the guy studying Spanish and training to become one of the few family physicians in his class. Once he completed his residency, in 1998, he joined the staff of a family-medicine practice in Camden. It was in a cheaply constructed, boxlike, one-story building on a desolate street of bars, car-repair shops, and empty lots. But he was young and eager to recapture the sense of purpose he'd felt volunteering at the clinic during medical school.

Few people shared his sense of possibility. Camden was in civic free fall, on its way to becoming one of the poorest, most crime-ridden cities in the nation. The local school system had gone into receivership. Corruption and mismanagement soon prompted a state takeover of the entire city. Just getting the sewage system to work could be a problem. The neglect of this anonymous shooting victim on Brenner's street was another instance of a city that had given up, and Brenner was tired of wondering why it had to be that way.

"I love the sense of danger that comes with brushing up against childhood obesity."

Around that time, a police reform commission was created, and Brenner was asked to serve as one of its two citizen members. He agreed and, to his surprise, became completely absorbed. The experts they called in explained the basic principles of effective community policing. He learned about George Kelling and James Q. Wilson's "broken-windows" theory, which argued that minor, visible neighborhood disorder breeds major crime. He learned about the former New York City police commissioner William Bratton and the Compstat approach to policing that he had championed in the nineties, which centered on mapping crime and focussing resources on the hot spots. The reform panel pushed the Camden Police Department to create computerized crime maps, and to change police beats and shifts to focus on the worst areas and times.

When the police wouldn't make the crime maps, Brenner made his own. He persuaded Camden's three main hospitals to let him have access to their medical billing records. He transferred the reams of data files onto a desktop computer, spent weeks figuring out how to pull the chaos of information into a searchable database, and then started tabulating the emergency-room visits of victims of serious assault. He created maps showing where the crime victims lived. He pushed for policies that would let the Camden police chief assign shifts based on the crime statistics—only to find himself in a showdown with the police unions.

"He has no clue," the president of the city police superiors' union said to the *Philadelphia Inquirer*. "I just think that his comments about what kind of schedule we should be on, how we should be deployed, are laughable."

The unions kept the provisions out of the contract. The reform commission disbanded; Brenner withdrew from the cause, beaten. But he continued to dig into the database on his computer, now mostly out of idle interest.

Besides looking at assault patterns, he began studying patterns in the way patients flowed into and out of Camden's hospitals. "I'd just sit there and play with the data for hours," he says, and the more he played the more he found. For instance, he ran the data on the locations where ambulances picked up patients with fall injuries, and discovered that a single building in central Camden sent more people to the hospital with serious falls—fifty-seven elderly in two years—than any other in the city, resulting in almost three million dollars in health-care bills. "It was just this amazing window into the health-care delivery system," he says.

So he took what he learned from police reform and tried a Compstat approach to the city's health-care performance—a Healthstat, so to speak. He made block-by-block maps of the city, color-coded by the hospital costs of its residents, and looked for the hot spots. The two most expensive city blocks were in north Camden, one that had a large nursing home called Abigail House and one that had a low-income housing tower called Northgate II. He found that between January of 2002 and June of 2008 some nine hundred people in the two buildings accounted for more than four thousand hospital visits and about two hundred million dollars in health-care bills. One patient had three hundred and twenty-four admissions in five years. The most expensive patient cost insurers $3.5 million.

Brenner wasn't all that interested in costs; he was more interested in helping people who received bad health care. But in his experience the people with the highest medical costs—the people cycling in and out of the hospital—were usually the people receiving the worst care. "Emergency-room visits and hospital admissions should be considered failures of the health-care system until proven otherwise," he told me—failures of prevention and of timely, effective care.

If he could find the people whose use of medical care was highest, he figured, he could do something to help them. If he helped them, he would

also be lowering their health-care costs. And, if the stats approach to crime was right, targeting those with the highest health-care costs would help lower the entire city's health-care costs. His calculations revealed that just one per cent of the hundred thousand people who made use of Camden's medical facilities accounted for thirty per cent of its costs. That's only a thousand people—about half the size of a typical family physician's panel of patients.

Things, of course, got complicated. It would have taken months to get the approvals needed to pull names out of the data and approach people, and he was impatient to get started. So, in the spring of 2007, he held a meeting with a few social workers and emergency-room doctors from hospitals around the city. He showed them the cost statistics and use patterns of the most expensive one per cent. "These are the people I want to help you with," he said. He asked for assistance reaching them. "Introduce me to your worst-of-the-worst patients," he said.

They did. Then he got permission to look up the patients' data to confirm where they were on his cost map. "For all the stupid, expensive, predictive-modelling software that the big venders sell," he says, "you just ask the doctors, 'Who are your most difficult patients?,' and they can identify them."

The first person they found for him was a man in his mid-forties whom I'll call Frank Hendricks. Hendricks had severe congestive heart failure, chronic asthma, uncontrolled diabetes, hypothyroidism, gout, and a history of smoking and alcohol abuse. He weighed five hundred and sixty pounds. In the previous three years, he had spent as much time in hospitals as out. When Brenner met him, he was in intensive care with a tracheotomy and a feeding tube, having developed septic shock from a gallbladder infection.

Brenner visited him daily. "I just basically sat in his room like I was a third-year med student, hanging out with him for an hour, hour and a half every day, trying to figure out what makes the guy tick," he recalled. He learned that Hendricks used to be an auto detailer and a cook. He had a longtime girlfriend and two children, now grown. A toxic combination of poor health, Johnnie Walker Red, and, it emerged, cocaine addiction had left him unreliably employed, uninsured, and living in a welfare motel. He had no consistent set of doctors, and almost no prospects for turning his situation around.

After several months, he had recovered enough to be discharged. But, out in the world, his life was simply another hospitalization waiting to happen. By then, however, Brenner had figured out a few things he could do to help. Some of it was simple doctor stuff. He made sure he followed Hendricks closely enough to recognize when serious problems were emerging. He double-checked that the plans and prescriptions the specialists had made for Hendricks's many problems actually fit together—and, when they didn't, he got on the phone to sort things out. He teamed up with a nurse practitioner who could make home visits to check blood-sugar levels and blood pressure, teach Hendricks about what he could do to stay healthy, and make sure he was getting his medications.

A lot of what Brenner had to do, though, went beyond the usual doctor stuff. Brenner got a social worker to help Hendricks apply for disability insurance, so that he could leave the chaos of welfare motels, and have access to a consistent set of physicians. The team also pushed him to find sources of stability and value in his life. They got him to return to Alcoholics Anonymous, and, when Brenner found out that he was a devout Christian, he urged him to return to church. He told Hendricks that he needed to cook his own food once in a while, so he could get back in the habit of doing it. The main thing he was up against was Hendricks's hopelessness. He'd given up. "Can you imagine being in the hospital that long, what that does to you?" Brenner asked.

I spoke to Hendricks recently. He has gone without alcohol for a year, cocaine for two years, and smoking for three years. He lives with his girlfriend in a safer neighborhood, goes to church, and weathers family crises. He cooks his own meals now. His diabetes and congestive heart failure are under much better control. He's lost two hundred and twenty pounds, which means, among other things, that if he falls he can pick himself up, rather than having to call for an ambulance.

"The fun thing about this work is that you can be there when the light switch goes on for a patient," Brenner told me. "It doesn't happen at the pace we want. But you can see it happen."

With Hendricks, there was no miraculous turnaround. "Working with him didn't feel any different from working with any patient on smoking, bad diet, not exercising—working on any particular rut someone has gotten into," Brenner said. "People are people, and they get into situations they

don't necessarily plan on. My philosophy about primary care is that the only person who has changed anyone's life is their mother. The reason is that she cares about them, and she says the same simple thing over and over and over." So he tries to care, and to say a few simple things over and over and over.

I asked Hendricks what he made of Brenner when they first met.

"He struck me as odd," Hendricks said. "His appearance was not what I expected of a young, clean-cut doctor." There was that beard. There was his manner, too. "His whole premise was 'I'm here for you. I'm not here to be a part of the medical system. I'm here to get you back on your feet.' "

An ordinary cold can still be a major setback for Hendricks. He told me that he'd been in the hospital four times this past summer. But the stays were a few days at most, and he's had no more cataclysmic, weeks-long I.C.U. stays.

Was this kind of success replicable? As word went out about Brenner's interest in patients like Hendricks, he received more referrals. Camden doctors were delighted to have someone help with their "worst of the worst." He took on half a dozen patients, then two dozen, then more. It became increasingly difficult to do this work alongside his regular medical practice. The clinic was already under financial strain, and received nothing for assisting these patients. If it were up to him, he'd recruit a whole staff of primary-care doctors and nurses and social workers, based right in the neighborhoods where the costliest patients lived. With the tens of millions of dollars in hospital bills they could save, he'd pay the staff double to serve as Camden's élite medical force and to rescue the city's health-care system.

But that's not how the health-insurance system is built. So he applied for small grants from philanthropies like the Robert Wood Johnson Foundation and the Merck Foundation. The money allowed him to ramp up his data system and hire a few people, like the nurse practitioner and the social worker who had helped him with Hendricks. He had some desk space at Cooper Hospital, and he turned it over to what he named the Camden Coalition of Healthcare Providers. He spoke to people who had been doing similar work, studied "medical home" programs for the chronically ill in Seattle, San Francisco, and Pennsylvania, and adopted some of their lessons.

By late 2010, his team had provided care for more than three hundred people on his "super-utilizer" map.

I spent a day with Kathy Jackson, the nurse practitioner, and Jessica Cordero, a medical assistant, to see what they did. The Camden Coalition doesn't have enough money for a clinic where they can see patients. They rely exclusively on home visits and phone calls.

Over the phone, they inquire about emerging health issues, check for insurance or housing problems, ask about unfilled prescriptions. All the patients get the team's urgent-call number, which is covered by someone who can help them through a health crisis. Usually, the issue can be resolved on the spot—it's a headache or a cough or the like—but sometimes it requires an unplanned home visit, to perform an examination, order some tests, provide a prescription. Only occasionally does it require an emergency room.

Patients wouldn't make the call in the first place if the person picking up weren't someone like Jackson or Brenner—someone they already knew and trusted. Even so, patients can disappear for days or weeks at a time. "High-utilizer work is about building relationships with people who are in crisis," Brenner said. "The ones you build a relationship with, you can change behavior. Half we can build a relationship with. Half we can't."

One patient I spent time with illustrated the challenges. If you were a doctor meeting him in your office, you would quickly figure out that his major problems were moderate developmental deficits and out-of-control hypertension and diabetes. His blood pressure and blood sugars were so high that, at the age of thirty-nine, he was already developing blindness and advanced kidney disease. Unless something changed, he was perhaps six months away from complete kidney failure.

You might decide to increase his insulin dose and change his blood-pressure medicine. But you wouldn't grasp what the real problem was until you walked up the cracked concrete steps of the two-story brownstone where he lives with his mother, waited for him to shove aside the old newspapers and unopened mail blocking the door, noticed Cordero's shake of the head warning you not to take the rumpled seat he's offering because of the ant trail running across it, and took in the stack of dead computer monitors, the barking mutt chained to an inner doorway, and the rotten fruit on a

newspaper-covered tabletop. According to a state evaluation, he was capable of handling his medications, and, besides, he lived with his mother, who could help. But one look made it clear that they were both incapable.

Jackson asked him whether he was taking his blood-pressure pills each day. Yes, he said. Could he show her the pill bottles? As it turned out, he hadn't taken any pills since she'd last visited, the week before. His finger-stick blood sugar was twice the normal level. He needed a better living situation. The state had turned him down for placement in supervised housing, pointing to his test scores. But after months of paperwork—during which he steadily worsened, passing in and out of hospitals—the team was finally able to get him into housing where his medications could be dispensed on a schedule. He had made an overnight visit the previous weekend to test the place out.

"I liked it," he said. He moved in the next week. And, with that, he got a chance to avert dialysis—and its tens of thousands of dollars in annual costs—at least for a while.

Not everyone lets the team members into his or her life. One of their patients is a young woman of no fixed address, with asthma and a crack-cocaine habit. The crack causes severe asthma attacks and puts her in the hospital over and over again. The team members have managed occasionally to track her down in emergency rooms or recognize her on street corners. All they can do is give her their number, and offer their help if she ever wanted it. She hasn't.

Work like this has proved all-consuming. In May, 2009, Brenner closed his regular medical practice to focus on the program full time. It remains unclear how the program will make ends meet. But he and his team appear to be having a major impact. The Camden Coalition has been able to measure its long-term effect on its first thirty-six super-utilizers. They averaged sixty-two hospital and E.R. visits per month before joining the program and thirty-seven visits after—a forty-per-cent reduction. Their hospital bills averaged $1.2 million per month before and just over half a million after—a fifty-six-per-cent reduction.

These results don't take into account Brenner's personnel costs, or the costs of the medications the patients are now taking as prescribed, or the fact that some of the patients might have improved on their own (or died, reducing

their costs permanently). The net savings are undoubtedly lower, but they remain, almost certainly, revolutionary. Brenner and his team are out there on the boulevards of Camden demonstrating the possibilities of a strange new approach to health care: to look for the most expensive patients in the system and then direct resources and brainpower toward helping them.

Jeff Brenner has not been the only one to recognize the possibilities in focussing on the hot spots of medicine. One Friday afternoon, I drove to an industrial park on the outskirts of Boston, where a rapidly growing data-analysis company called Verisk Health occupies a floor of a nondescript office complex. It supplies "medical intelligence" to organizations that pay for health benefits—self-insured businesses, many public employers, even the government of Abu Dhabi.

Privacy laws prevent U.S. employers from looking at the details of their employees' medical spending. So they hand their health-care payment data over to companies that analyze the patterns and tell them how to reduce their health-insurance spending. Mostly, these companies give financial advice on changing benefits—telling them, say, to increase employee co-payments for brand-name drugs or emergency-room visits. But even employers who cut benefits find that their costs continue to outpace their earnings. Verisk, whose clients pay health-care bills for fifteen million patients, is among the data companies that are trying a more sophisticated approach.

Besides the usual statisticians and economists, Verisk recruited doctors to dive into the data. I met one of them, Nathan Gunn, who was thirty-six years old, had completed his medical training at the University of California, San Francisco, and was practicing as an internist part time. The rest of his time he worked as Verisk's head of research. Mostly, he was in meetings or at his desk poring through "data runs" from clients. He insisted that it was every bit as absorbing as seeing sick patients—sometimes more so. Every data run tells a different human story, he said.

At his computer, he pulled up a data set for me, scrubbed of identifying information, from a client that manages health-care benefits for some two hundred and fifty employers—school districts, a large church association, a bus company, and the like. They had a hundred thousand "covered lives" in all. Payouts for those people rose eight per cent a year, at least three times as fast as the employers' earnings. This wasn't good, but the numbers seemed pretty dry and abstract so far. Then he narrowed the list to the top five per

cent of spenders—just five thousand people accounted for almost sixty per cent of the spending—and he began parsing further.

"Take two ten-year-old boys with asthma," he said. "From a disease standpoint, they're exactly the same cost, right? Wrong. Imagine one of those kids never fills his inhalers and has been in urgent care with asthma attacks three times over the last year, probably because Mom and Dad aren't really on top of it." That's the sort of patient Gunn uses his company's medical-intelligence software program to zero in on—a patient who is sick and getting inadequate care. "That's really the sweet spot for preventive care," Gunn said.

He pulled up patients with known coronary-artery disease. There were nine hundred and twenty-one, he said, reading off the screen. He clicked a few more times and raised his eyebrows. One in seven of them had not had a full office visit with a physician in more than a year. "You can do something about that," he said.

"Let's do the E.R.-visit game," he went on. "This is a fun one." He sorted the patients by number of visits, much as Jeff Brenner had done for Camden. In this employed population, the No. 1 patient was a twenty-five-year-old woman. In the past ten months, she'd had twenty-nine E.R. visits, fifty-one doctor's office visits, and a hospital admission.

"I can actually drill into these claims," he said, squinting at the screen. "All these claims here are migraine, migraine, migraine, migraine, headache, headache, headache." For a twenty-five-year-old with her profile, he said, medical payments for the previous ten months would be expected to total twenty-eight hundred dollars. Her actual payments came to more than fifty-two thousand dollars—for "headaches."

Was she a drug seeker? He pulled up her prescription profile, looking for narcotic prescriptions. Instead, he found prescriptions for insulin (she was apparently diabetic) and imipramine, an anti-migraine treatment. Gunn was struck by how faithfully she filled her prescriptions. She hadn't missed a single renewal—"which is actually interesting," he said. That's not what you usually find at the extreme of the cost curve.

The story now became clear to him. She suffered from terrible migraines. She took her medicine, but it wasn't working. When the headaches got bad, she'd go to the emergency room or to urgent care. The doctors would do CT

and MRI scans, satisfy themselves that she didn't have a brain tumor or an aneurysm, give her a narcotic injection to stop the headache temporarily, maybe renew her imipramine prescription, and send her home, only to have her return a couple of weeks later and see whoever the next doctor on duty was. She wasn't getting what she needed for adequate migraine care—a primary physician taking her in hand, trying different medications in a systematic way, and figuring out how to better keep her headaches at bay.

As he sorts through such stories, Gunn usually finds larger patterns, too. He told me about an analysis he had recently done for a big information-technology company on the East Coast. It provided health benefits to seven thousand employees and family members, and had forty million dollars in "spend." The firm had already raised the employees' insurance co-payments considerably, hoping to give employees a reason to think twice about unnecessary medical visits, tests, and procedures—make them have some "skin in the game," as they say. Indeed, almost every category of costly medical care went down: doctor visits, emergency-room and hospital visits, drug prescriptions. Yet employee health costs continued to rise—climbing almost ten per cent each year. The company was baffled.

Gunn's team took a look at the hot spots. The outliers, it turned out, were predominantly early retirees. Most had multiple chronic conditions—in particular, coronary-artery disease, asthma, and complex mental illness. One had badly worsening heart disease and diabetes, and medical bills over two years in excess of eighty thousand dollars. The man, dealing with higher co-payments on a fixed income, had cut back to filling only half his medication prescriptions for his high cholesterol and diabetes. He made few doctor visits. He avoided the E.R.—until a heart attack necessitated emergency surgery and left him disabled with chronic heart failure.

The higher co-payments had backfired, Gunn said. While medical costs for most employees flattened out, those for early retirees jumped seventeen per cent. The sickest patients became much more expensive because they put off care and prevention until it was too late.

The critical flaw in our health-care system that people like Gunn and Brenner are finding is that it was never designed for the kind of patients who incur the highest costs. Medicine's primary mechanism of service is the doctor visit and the E.R. visit. (Americans make more than a billion such visits each year, according to the Centers for Disease Control.) For a thirty-

year-old with a fever, a twenty-minute visit to the doctor's office may be just the thing. For a pedestrian hit by a minivan, there's nowhere better than an emergency room. But these institutions are vastly inadequate for people with complex problems: the forty-year-old with drug and alcohol addiction; the eighty-four-year-old with advanced Alzheimer's disease and a pneumonia; the sixty-year-old with heart failure, obesity, gout, a bad memory for his eleven medications, and half a dozen specialists recommending different tests and procedures. It's like arriving at a major construction project with nothing but a screwdriver and a crane.

Outsiders tend to be the first to recognize the inadequacies of our social institutions. But, precisely because they are outsiders, they are usually in a poor position to fix them. Gunn, though a doctor, mostly works for people who do not run health systems—employers and insurers. So he counsels them about ways to tinker with the existing system. He tells them how to change co-payments and deductibles so they at least aren't making their cost problems worse. He identifies doctors and hospitals that seem to be providing particularly ineffective care for high-needs patients, and encourages clients to shift contracts. And he often suggests that clients hire case-management companies—a fast-growing industry with telephone banks of nurses offering high-cost patients advice in the hope of making up for the deficiencies of the system.

The strategy works, sort of. Verisk reports that most of its clients can slow the rate at which their health costs rise, at least to some extent. But few have seen decreases, and it's not obvious that the improvements can be sustained. Brenner, by contrast, is reinventing medicine from the inside. But he does not run a health-care system, and had to give up his practice to sustain his work. He is an outsider on the inside. So you might wonder whether medical hot-spotting can really succeed on a scale that would help large populations. Yet there are signs that it can.

A recent Medicare demonstration program, given substantial additional resources under the new health-care-reform law, offers medical institutions an extra monthly payment to finance the coördination of care for their most chronically expensive beneficiaries. If total costs fall more than five per cent compared with those of a matched set of control patients, the program allows institutions to keep part of the savings. If costs fail to decline, the institutions have to return the monthly payments.

Several hospitals took the deal when the program was offered, in 2006. One was the Massachusetts General Hospital, in Boston. It asked a general internist named Tim Ferris to design the effort. The hospital had twenty-six hundred chronically high-cost patients, who together accounted for sixty million dollars in annual Medicare spending. They were in nineteen primary-care practices, and Ferris and his team made sure that each had a nurse whose sole job was to improve the coördination of care for these patients. The doctors saw the patients as usual. In between, the nurses saw them for longer visits, made surveillance phone calls, and, in consultation with the doctors, tried to recognize and address problems before they resulted in a hospital visit.

Three years later, hospital stays and trips to the emergency room have dropped more than fifteen per cent. The hospital hit its five-per-cent cost-reduction target. And the team is just getting the hang of what it can do.

Recently, I visited an even more radically redesigned physician practice, in Atlantic City. Cross the bridge into town (Atlantic City is on an island, I learned), ignore the Trump Plaza and Caesars casinos looming ahead of you, drive a few blocks along the Monopoly-board streets (the game took its street names from here), turn onto Tennessee Avenue, and enter the doctors' office building that's across the street from the ninety-nine-cent store and the city's long-shuttered supermarket. On the second floor, just past the occupational-health clinic, you will find the Special Care Center. The reception area, with its rustic taupe upholstery and tasteful lighting, looks like any other doctors' office. But it houses an experiment started in 2007 by the health-benefit programs of the casino workers' union and of a hospital, AtlantiCare Medical Center, the city's two largest pools of employees.

Both are self-insured—they are large enough to pay for their workers' health care directly—and both have been hammered by the exploding costs. Yes, even hospitals are having a hard time paying their employees' medical bills. As for the union, its contracts are frequently for workers' total compensation—wages plus benefits. It gets a fixed pot. Year after year, the low-wage busboys, hotel cleaners, and kitchen staff voted against sacrificing their health benefits. As a result, they have gone without a wage increase for years. Out of desperation, the union's health fund and the hospital decided to try something new. They got a young Harvard internist named Rushika Fernandopulle to run a clinic exclusively for workers with exceptionally high medical expenses.

Fernandopulle, who was born in Sri Lanka and raised in Baltimore, doesn't seem like a radical when you meet him. He's short and round-faced, smiles a lot, and displays two cute rabbit teeth as he tells you how ridiculous the health-care system is and how he plans to change it all. Jeff Brenner was on his advisory board, along with others who have pioneered the concept of intensive outpatient care for complex high-needs patients. The hospital provided the floor space. Fernandopulle created a point system to identify employees likely to have high recurrent costs, and they were offered the chance to join the new clinic.

The Special Care Center reinvented the idea of a primary-care clinic in almost every way. The union's and the hospital's health funds agreed to switch from paying the doctors for every individual office visit and treatment to paying a flat monthly fee for each patient. That cut the huge expense that most clinics incur from billing paperwork. The patients were given unlimited access to the clinic without charges—no co-payments, no insurance bills. This, Fernandopulle explained, would force doctors on staff to focus on service, in order to retain their patients and the fees they would bring.

The payment scheme also allowed him to design the clinic around the things that sick, expensive patients most need and value, rather than the ones that pay the best. He adopted an open-access scheduling system to guarantee same-day appointments for the acutely ill. He customized an electronic information system that tracks whether patients are meeting their goals. And he staffed the clinic with people who would help them do it. One nurse practitioner, for instance, was responsible for trying to get every smoker to quit.

I got a glimpse of how unusual the clinic is when I sat in on the staff meeting it holds each morning to review the medical issues of the patients on the appointment books. There was, for starters, the very existence of the meeting. I had never seen this kind of daily huddle at a doctor's office, with clinicians popping open their laptops and pulling up their patient lists together. Then there was the particular mixture of people who squeezed around the conference table. As in many primary-care offices, the staff had two physicians and two nurse practitioners. But a full-time social worker and the front-desk receptionist joined in for the patient review, too. And, outnumbering them all, there were eight full-time "health coaches."

Fernandopulle created the position. Each health coach works with patients—in person, by phone, by e-mail—to help them manage their health. Fernandopulle got the idea from the *promotoras*, community health workers, whom he had seen on a medical mission in the Dominican Republic. The coaches work with the doctors but see their patients far more frequently than the doctors do, at least once every two weeks. Their most important attribute, Fernandopulle explained, is a knack for connecting with sick people, and understanding their difficulties. Most of the coaches come from their patients' communities and speak their languages. Many have experience with chronic illness in their own families. (One was himself a patient in the clinic.) Few had clinical experience. I asked each of the coaches what he or she had done before working in the Special Care Center. One worked the register at a Dunkin' Donuts. Another was a Sears retail manager. A third was an administrative assistant at a casino.

"We recruit for attitude and train for skill," Fernandopulle said. "We don't recruit from health care. This kind of care requires a very different mind-set from usual care. For example, what is the answer for a patient who walks up to the front desk with a question? The answer is 'Yes.' 'Can I see a doctor?' 'Yes.' 'Can I get help making my ultrasound appointment?' 'Yes.' Health care trains people to say no to patients." He told me that he'd had to replace half of the clinic's initial hires—including a doctor—because they didn't grasp the focus on patient service.

In forty-five minutes, the staff did a rapid run-through of everyone's patients. They reviewed the requests that patients had made by e-mail or telephone, the plans for the ones who had appointments that day. Staff members made sure that all patients who made a sick visit the day before got a follow-up call within twenty-four hours, that every test ordered was reviewed, that every unexpected problem was addressed.

Most patients required no more than a ten-second mention. Mr. Green didn't turn up for his cardiac testing or return calls about it. "I know where his wife works. I'll track her down," the receptionist said. Ms. Blue is pregnant and on a high-blood-pressure medication that's unsafe in pregnancy. "I'll change her prescription right now," her doctor said, and keyed it in. A handful of patients required longer discussion. One forty-five-year-old heart-disease patient had just had blood tests that showed worsening kidney failure. The team decided to repeat the blood tests that morning, organize a kidney

ultrasound in the afternoon if the tests confirmed the finding, and have him seen in the office at the end of the day.

A staff member read out the hospital census. Of the clinic's twelve hundred chronically ill patients, just one was in the hospital, and she was being discharged. The clinic's patients had gone four days without a single E.R. visit. On hearing this news, staffers cheered and broke into applause.

Afterward, I met a patient, Vibha Gandhi. She was fifty-seven years old and had joined the clinic after suffering a third heart attack. She and her husband, Bharat, are Indian immigrants. He cleans casino bathrooms for thirteen dollars an hour on the night shift. Vibha has long had poor health, with diabetes, obesity, and congestive heart failure, but things got much worse in the summer of 2009. A heart attack landed her in intensive care, and her coronary-artery disease proved so advanced as to be inoperable. She arrived in a wheelchair for her first clinic visit. She could not walk more than a few steps without losing her breath and getting a viselike chest pain. The next step for such patients is often a heart transplant.

A year and a half later, she is out of her wheelchair. She attends the clinic's Tuesday yoga classes. With the help of a walker, she can go a quarter mile without stopping. Although her condition is still fragile—she takes a purseful of medications, and a bout of the flu would send her back to an intensive-care unit—her daily life is far better than she once imagined.

"I didn't think I would live this long," Vibha said through Bharat, who translated her Gujarati for me. "I didn't want to live."

I asked her what had made her better. The couple credited exercise, dietary changes, medication adjustments, and strict monitoring of her diabetes.

But surely she had been encouraged to do these things after her first two heart attacks. What made the difference this time?

"Jayshree," Vibha said, naming the health coach from Dunkin' Donuts, who also speaks Gujarati.

"Jayshree pushes her, and she listens to her only and not to me," Bharat said.

"Why do you listen to Jayshree?" I asked Vibha.

"Because she talks like my mother," she said.

Fernandopulle carefully tracks the statistics of those twelve hundred patients. After twelve months in the program, he found, their emergency-room visits and hospital admissions were reduced by more than forty per cent. Surgical procedures were down by a quarter. The patients were also markedly healthier. Among five hundred and three patients with high blood pressure, only two were in poor control. Patients with high cholesterol had, on average, a fifty-point drop in their levels. A stunning sixty-three per cent of smokers with heart and lung disease quit smoking. In surveys, service and quality ratings were high.

But was the program saving money? The team, after all, was more expensive than typical primary care. And certain costs shot up. Because patients took their medications more consistently, drug costs were higher. The doctors ordered more mammograms and diagnostic tests, and caught and treated more cancers and other conditions. There's also the statistical phenomenon known as "regression to the mean": the super-high-cost patients may have been on their way to getting better (and less costly) on their own.

So the union's health fund enlisted an independent economist to evaluate the clinic's one-year results. According to the data, these workers made up a third of the local union's costliest ten per cent of members. To determine if the clinic was really making a difference, the economist compared their costs over twelve months with those of a similar group of Las Vegas casino workers. The results, he cautioned, are still preliminary. The sample was small. One patient requiring a heart transplant could wipe away any savings overnight. Nonetheless, compared with the Las Vegas workers, the Atlantic City workers in Fernandopulle's program experienced a twenty-five-per-cent drop in costs.

And this was just the start. The program, Fernandopulle told me, is still discovering new tricks. His team just recently figured out, for instance, that one reason some patients call 911 for problems the clinic would handle better is that they don't have the clinic's twenty-four-hour call number at hand when they need it. The health coaches told the patients to program it into their cell-phone speed dial, but many didn't know how to do that. So the health coaches began doing it for them, and the number of 911 calls fell. High-cost habits are sticky; staff members are still learning the subtleties of unsticking them.

Their most difficult obstacle, however, has been the waywardness not of patients but of doctors—the doctors whom the patients see outside the clinic. Jeff Brenner's Camden patients are usually uninsured or on welfare; their doctors were happy to have someone else deal with them. The Atlantic City casino workers and hospital staff, on the other hand, had the best-paying insurance in town. Some doctors weren't about to let that business slip away.

Fernandopulle told me about a woman who had seen a cardiologist for chest pain two decades ago, when she was in her twenties. It was the result of a temporary, inflammatory condition, but he continued to have her see him for an examination and an electrocardiogram every three months, and a cardiac ultrasound every year. The results were always normal. After the clinic doctors advised her to stop, the cardiologist called her at home to say that her health was at risk if she didn't keep seeing him. She went back.

The clinic encountered similar troubles with some of the doctors who saw its hospitalized patients. One group of hospital-based internists was excellent, and coördinated its care plans with the clinic. But the others refused, resulting in longer stays and higher costs (and a fee for every visit, while the better group happened to be the only salaried one). When Fernandopulle arranged to direct the patients to the preferred doctors, the others retaliated, trolling the emergency department and persuading the patients to choose them instead.

" 'Rogues,' we call them," Fernandopulle said. He and his colleagues tried warning the patients about the rogue doctors and contacting the E.R. staff to make sure they knew which doctors were preferred. "One time, we literally pinned a note to a patient, like he was Paddington Bear," he said. They've ended up going to the hospital, and changing the doctors themselves when they have to. As the saying goes, one man's cost is another man's income.

The AtlantiCare hospital system is in a curious position in all this. Can it really make sense for a hospital to invest in a program, like the Special Care Center, that aims at reducing hospitalizations, even if its employees are included? I asked David Tilton, the president and C.E.O. of the system, why he was doing it. He had several answers. Some were of the it's-the-right-thing-to-do variety. But I was interested in the hard-nosed reasons. The Atlantic City economy, he said, could not sustain his health system's perpetually rising costs. His hospital either fought the pressure to control

costs and went down with the local economy or learned how to benefit from cost control.

And there *are* ways to benefit. At a minimum, a successful hospital could attract patients from competitors, cushioning it against a future in which people need hospitals less. Two decades ago, for instance, Denmark had more than a hundred and fifty hospitals for its five million people. The country then made changes to strengthen the quality and availability of outpatient primary-care services (including payments to encourage physicians to provide e-mail access, off-hours consultation, and nurse managers for complex care). Today, the number of hospitals has shrunk to seventy-one. Within five years, fewer than forty are expected to be required. A smart hospital might position itself to be one of the last ones standing.

Could anything that dramatic happen here? An important idea is getting its test run in America: the creation of intensive outpatient care to target hot spots, and thereby reduce over-all health-care costs. But, if it works, hospitals will lose revenue and some will have to close. Medical companies and specialists profiting from the excess of scans and procedures will get squeezed. This will provoke retaliation, counter-campaigns, intense lobbying for Washington to obstruct reform.

The stats-and-stethoscope upstarts are nonetheless making their dash. Rushika Fernandopulle has set up a version of his Special Care program in Seattle, for Boeing workers, and is developing one in Las Vegas, for casino workers. Nathan Gunn and Verisk Health have landed new contracts during the past year with companies providing health benefits to more than four million employees and family members. Tim Ferris has obtained federal approval to spread his program for Medicare patients to two other hospitals in the Partners Healthcare System, in Boston (including my own). Jeff Brenner, meanwhile, is seeking to lower health-care costs for all of Camden, by getting its primary-care physicians to extend the hot-spot strategy citywide. We've been looking to Washington to find out how health-care reform will happen. But people like these are its real leaders.

During my visit to Camden, I attended a meeting that Brenner and several community groups had organized with residents of Northgate II, the building with the highest hospital billing in the city. He wanted to run an idea by them. The meeting took place in the building's ground-floor lounge. There was juice in Styrofoam cups and potato chips on little red plastic plates. A

pastor with the Camden Bible Tabernacle started things off with a prayer. Brenner let one of the other coalition members do the talking.

How much money, he asked, did the residents think had been spent on emergency-room and hospital visits in the past five years for the people in this one building? They had no idea. He wrote out the numbers on an easel pad, but they were imponderable abstractions. The residents' eyes widened only when he said that the payments, even accounting for unpaid bills, added up to almost sixty thousand dollars per person. He asked how many of them believed that they had received sixty thousand dollars' worth of health care. That was when the stories came out: the doctors who wouldn't give anyone on Medicaid an office appointment; the ten-hour emergency-room waits for ten minutes with an intern.

Brenner was proposing to open a doctor's office right in their building, which would reduce their need for hospital visits. If it delivered better care and saved money, the doctor's office would receive part of the money that it saved Medicare and Medicaid, and would be able to add services—services that the residents could help choose. With enough savings, they could have same-day doctor visits, nurse practitioners at night, a social worker, a psychologist. When Brenner's scenario was described, residents murmured approval, but the mention of a social worker brought questions.

"Is she going to be all up in my business?" a woman asked. "I don't know if I like that. I'm not sure I want a social worker hanging around here."

This doctor's office, people were slowly realizing, would be involved in their lives—a medical professional would be after them about their smoking, drinking, diet, medications. That was O.K. if the person were Dr. Brenner. They knew him. They believed that he cared about them. Acceptance, however, would clearly depend upon execution; it wasn't guaranteed. There was similar ambivalence in the neighborhoods that Compstat strategists targeted for additional—and potentially intrusive—policing.

Yet the stakes in health-care hot-spotting are enormous, and go far beyond health care. A recent report on more than a decade of education-reform spending in Massachusetts detailed a story found in every state. Massachusetts sent nearly a billion dollars to school districts to finance smaller class sizes and better teachers' pay, yet every dollar ended up being diverted to covering rising health-care costs. For each dollar added to school

budgets, the costs of maintaining teacher health benefits took a dollar and forty cents.

Every country in the world is battling the rising cost of health care. No community anywhere has demonstrably lowered its health-care costs (not just slowed their rate of increase) by improving medical services. They've lowered costs only by cutting or rationing them. To many people, the problem of health-care costs is best encapsulated in a basic third-grade lesson: you can't have it all. You want higher wages, lower taxes, less debt? Then cut health-care services.

People like Jeff Brenner are saying that we *can* have it all—teachers *and* health care. To be sure, uncertainties remain. Their small, localized successes have not yet been replicated in large populations. Up to a fourth of their patients face problems of a kind they have avoided tackling so far: catastrophic conditions. These are the patients who are in the top one per cent of costs because they were in a car crash that resulted in a hundred thousand dollars in surgery and intensive-care expenses, or had a cancer requiring seven thousand dollars a week for chemo and radiation. There's nothing much to be done for those patients, you'd think. Yet they are also victims of poor and disjointed service. Improving the value of the services—rewarding better results per dollar spent—could lead to dramatic innovations in catastrophic care, too.

The new health-reform law—Obamacare—is betting big on the Brenners of the world. It says that we can afford to subsidize insurance for millions, remove the ability of private and public insurers to cut high-cost patients from their rolls, *and* improve the quality of care. The law authorizes new forms of Medicare and Medicaid payment to encourage the development of "medical homes" and "accountable care organizations"—doctors' offices and medical systems that get financial benefits for being more accessible to patients, better organized, and accountable for reducing the over-all costs of care. Backers believe that, given this support, innovators like Brenner will transform health care everywhere.

Critics say that it's a pipe dream—more money down the health-care sinkhole. They could turn out to be right, Brenner told me; a well-organized opposition could scuttle efforts like his. "In the next few years, we're going to have absolutely irrefutable evidence that there are ways to reduce health-care costs, and they are 'high touch' and they are at the level of care," he

said. "We are going to know that, hands down, this is possible." From that point onward, he said, "it's a political problem." The struggle will be to survive the obstruction of lobbies, and the partisan tendency to view success as victory for the other side.

Already, these forces of resistance have become Brenner's prime concern. He needs state legislative approval to bring his program to Medicaid patients at Northgate II and across Camden. He needs federal approval to qualify as an accountable care organization for the city's Medicare patients. In Camden, he has built support across a range of groups, from the state Chamber of Commerce to local hospitals to activist organizations. But for months—even as rising health costs and shrinking state aid have forced the city to contemplate further school cuts and the layoff of almost half of its police—he has been stalled. With divided branches at both the state and the federal level, "government just gets paralyzed," he says.

In the meantime, though, he's forging ahead. In December, he introduced an expanded computer database that lets Camden doctors view laboratory results, radiology reports, emergency-room visits, and discharge summaries for their patients from all the hospitals in town—and could show cost patterns, too. The absence of this sort of information is a daily impediment to the care of patients in Boston, where I practice. Right now, we're nowhere close to having such data. But this, I'm sure, will change. For in places like Camden, New Jersey, one of the poorest cities in America, there are people showing the way. ♦

Client #1	Lab	OIM	ED	Inpt/Obs	SDC/Oth	Total Charges	Total Adj.
6 mo pre-enroll	1	1	21	3	1	$191,028.40	$168,874.22
6 mo post-enroll	0	0	3	0	1	$13,307.15*	$11,968.73*
Notes:	- *Does not include charges associated with ED visit to MRCH 11/05/12 - Transitioned to Priority Care - Discharge from program scheduled soon						
Client #2	**Lab**	**OIM**	**ED**	**Inpt/Obs**	**SDC/Oth**	**Total Charges**	**Total Adj.**
6 mo pre-enroll	0	0	9	2	1	$353,802 June12-Nov12	$283,645 June-Nov2012
6 mo post-enroll	3	0	21	1	0	$171,495 Dec12-May13	$134,475 Dec12-May13
Notes:	- Discharged from program 6/21/13						
Client #3	**Lab**	**OIM**	**ED**	**Inpt/Obs**	**SDC/Oth**	**Total Charges**	**Total Adj.**
6 mo pre-enroll	0	1	29	4	0	$321,677 Aug12-Jan13	$196,068 Aug12-Jan13
6 mo post-enroll	8	0	40	2	1	$322,113 Feb13-Jul13	$281,199 Feb13-Jul13
Notes:	- Started on Suboxone program in July 2013...no ED/Inpt activity in August - Transitioned to Priority Care -						
Client #4	**Lab**	**OIM**	**ED**	**Inpt/Obs**	**SDC/Oth**	**Total Charges**	**Total Adj.**
6 mo pre-enroll	0	0	10	0	1	$12,227 Sep12-Feb13	$10,517 Sep12-Feb13
6 mo post-enroll	0	0	5	0	1	$10,942 Mar13-Aug13	$9,468 Mar13-Aug13
Notes:	- Transitioned to Priority Care						

Client #5	Lab	OIM	ED	Inpt/Obs	SDC/Oth	Total Charges	Total Adj.
6 mo pre-enroll	1	0	14	1	0	$68,842 Nov12-Apr13	$59794 Nov12-Apr13
6 mo post-enroll	1	2	3	0	0	$6175 May13-Aug13	$5957 May13-Aug13
Notes:	- Transitioned to Priority Care						
Client #6	**Lab**	**OIM**	**ED**	**Inpt/Obs**	**SDC/Oth**	**Total Charges**	**Total Adj.**
6 mo pre-enroll	1	0	15	0	0	$36,982 Oct12-Mar13	$34,522 Oct12-Mar13
6 mo post-enroll	0	0	4	0	0	$14,540 Apr13-Aug13	$10,754 Apr13-Aug13
Notes:	- Client has been in a substance abuse treatment program within the past several months - SU program on hold while in treatment program. Services resuming						
Client #7	**Lab**	**OIM**	**ED**	**Inpt/Obs**	**SDC/Oth**	**Total Charges**	**Total Adj.**
6 mo pre-enroll	0	1	2	1	0	$63,806 Nov12-Apr13	$47,851 Nov12-Apr13
6 mo post-enroll	0	1	0	1	0	$55,898 May13-Aug13	$$40,923 May13-Aug13
Notes:	- Transitioned to Priority Care						
Client #8	**Lab**	**OIM**	**ED**	**Inpt/Obs**	**SDC/Oth**	**Total Charges**	**Total Adj.**
6 mo pre-enroll	1	0	5	4	1	$123,731 Feb13-May13	$94,541 Feb13-May13
6 mo post-enroll	1	0	4	2	2	$169,838 June13-Aug13	$118,780 June13-Aug13
Notes:	- Very complicated case with. Mental Health issues override everything, but client unwilling to participate in mental health care. Plan is to discharge from program once all issues have been handed over to PCP office. - Moved to the area in Feb 2013. 4 mos of pre-enrollment data. - Information does not include inpatient stay at MRCH						

Client #9	**Lab**	**OIM**	**ED**	**Inpt/Obs**	**SDC/Oth**	**Total Charges**	**Total Adj.**
6 mo pre-enroll	1	1	25	5	2	$298,625 Oct12-Apr13	$240,074 Oct12-Apr13
6 mo post-enroll	0	4	15	0	0	$63,691 May13-Aug13	$48,758 May13-Aug13
Notes:	- Plan to transition to Priority Care with PCP case conference week of 9/23/13						
Client #10	**Lab**	**OIM**	**ED**	**Inpt/Obs**	**SDC/Oth**	**Total Charges**	**Total Adj.**
6 mo pre-enroll	1	1	8	1	2	$67,032 Nov12-May13	$61,216 Nov12-May13
6 mo post-enroll	1	1	6	0	0	$18,338 June13-Aug13	$14,851 June13-Aug13
Notes:	- No hospital activity in August. - Transition to Priority Care or Close to program week of 9/23/13.						
Client #11	**Lab**	**OIM**	**ED**	**Inpt/Obs**	**SDC/Oth**	**Total Charges**	**Total Adj.**
6 mo pre-enroll	0	3	24	0	1	$99,021 Nov12-May13	$92,880 Nov12-May13
6 mo post-enroll	0	0	3	0	0	$9,789 June13-Aug13	$6,656 June13-Aug13
Notes:	- Discharge from Program. Doing well.						
Client #12	**Lab**	**OIM**	**ED**	**Inpt/Obs**	**SDC/Oth**	**Total Charges**	**Total Adj.**
6 mo pre-enroll	4	1	5	3	0	$218,156 Feb13-July13	$177,481 Feb13-July13
6 mo post-enroll	0	0	0	1	0	$73,460 Aug13	$60,873 Aug13
Notes:							

Client #13	**Lab**	**OIM**	**ED**	**Inpt/Obs**	**SDC/Oth**	**Total Charges**	**Total Adj.**
6 mo pre-enroll	0	0	4	1	0	$56,786 Mar13-Aug13	$43,115 Mar13-Aug13
6 mo post-enroll							
Notes:	- Has established care with MMO. Will transition to Priority Care or discharge from program soon.						
Client #14	**Lab**	**OIM**	**ED**	**Inpt/Obs**	**SDC/Oth**	**Total Charges**	**Total Adj.**
6 mo pre-enroll	0	0	23	3	0	$222,735 Mar13-Aug13	$181,712 Mar13-Aug13
6 mo post-enroll							
Notes:	-						
Client #15	**Lab**	**OIM**	**ED**	**Inpt/Obs**	**SDC/Oth**	**Total Charges**	**Total Adj.**
6 mo pre-enroll	0	1	5	3	0	$163,102 Mar13-Aug13	$109,911 Mar13-Aug13
6 mo post-enroll							
Notes:	- Signed consent 9/5/13, but not "enrolled" until out of hospital.						
Client #16	**Lab**	**OIM**	**ED**	**Inpt/Obs**	**SDC/Oth**	**Total Charges**	**Total Adj.**
6 mo pre-enroll	0	0	11	1	0	$49,405 Mar13-Aug13	$36,988 Mar13-Aug13
6 mo post-enroll							
Notes:							

Client #17	**Lab**	**OIM**	**ED**	**Inpt/Obs**	**SDC/Oth**	**Total Charges**	**Total Adj.**
6 mo pre-enroll							
6 mo post-enroll							
Notes:							
Client #18	**Lab**	**OIM**	**ED**	**Inpt/Obs**	**SDC/Oth**	**Total Charges**	**Total Adj.**
6 mo pre-enroll							
6 mo post-enroll							
Notes:							
Client #19	**Lab**	**OIM**	**ED**	**Inpt/Obs**	**SDC/Oth**	**Total Charges**	**Total Adj.**
6 mo pre-enroll							
6 mo post-enroll							
Notes:							
Client #20	**Lab**	**OIM**	**ED**	**Inpt/Obs**	**SDC/Oth**	**Total Charges**	**Total Adj.**
6 mo pre-enroll							
6 mo post-enroll							
Notes:							