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# Your Next Hospital Bed Might Be at Home

In a time of strained capacity, the “hospital at home” movement is figuring out how to create an inpatient level of care anywhere.

Dr. Elizabeth De Pirro treating Richard Walker at his home in Albuquerque. Kholood Eid for The New York Times

**By Helen Ouyang**

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Manuelita Romero sipped cranberry juice as she lay in her bed, surrounded by pillows, blanketed under a soft white cover patterned with blue-and-green flowers. She was 92 and wearing pearl earrings and a necklace of rosary beads. Her bedroom, in a sandy, one-story adobe-style house in southwestern Albuquerque that she shared with one of her sons, was decorated with figures of saints and angels, along with more than a dozen crosses. Perfume bottles, hair spray and tubes of lotion crowded the top of her gold-trimmed cream dresser. Her house was very small but cheery and cozy, with crochet, flannel and serape coverings on the furniture and bright lemon-yellow cabinets in the kitchen.

Tucked in the back corner of her ordinary-seeming bedroom was a tall, slim metal pole. From its top hung a translucent bag, apparently empty; a thin clear tube dangled from its bottom. Hidden behind the bed was a small canister. A week earlier, Romero caught a drug-resistant urinary-tract infection that needed to be treated intravenously with a strong antibiotic. At the same time, she experienced a flare-up of her congestive heart failure: Her legs swelled enormously — a result of fluid backing up in her body — and she struggled to breathe. As she became weaker and more confused, her doctor, Elizabeth De Pirro, knew that she needed to be hospitalized.

But in this case, hospitalization had not required Romero to leave her house. De Pirro is the medical director of Presbyterian Healthcare Services’ Hospital at Home program, which has been providing people with acute inpatient-level care in their own homes since 2008, one of the oldest such programs in the country. Earlier that morning, a nurse stopped by Romero’s home to dispense a dose of antibiotics via IV drip from the metal pole. The medicine bag had been stored in the kitchen refrigerator. A cannula supplied oxygen from the canister to Romero’s nose. There were no devices present to measure the activity of her heart and lungs; there were no needles, or even a shred of gauze. The nurse had brought the equipment with her and packed it up and taken it away when she left.

De Pirro, who is 62 and has short, dark curly hair, olive skin and deep brown eyes, pulled up to Romero’s home in her dark gray Toyota 4Runner, then propped up a screen under the windshield to fend off the brutal New Mexico summer sun. Romero’s son, Victor, opened the door to the house and welcomed the doctor inside. After a quick greeting, De Pirro, wearing a hospital badge clipped to her collar but no white coat, began whipping out medical equipment from her backpack. She deftly maneuvered a blood-pressure cuff onto a part of Romero’s arm that she knew wouldn’t bother her and attached the pulse oximeter to her finger, then entered the vital signs into her laptop. She listened to Romero’s lungs and touched her ankles — they were less swollen today. The therapy was working, De Pirro told her. Then she called up Romero’s lab results on her laptop and showed them to Victor, pointing out that her numbers were improving. He nodded enthusiastically while explaining that he knew she was getting better even before he saw this data. He was eager to get her out of bed tomorrow.

De Pirro in Walker's home. Walker, who is 52 and in remission from a blood cancer, went to the emergency room and was diagnosed with pneumonia. Preferring to be at home with his wife and three children, he received oxygen therapy and five days of intravenous antibiotics through Presbyterian Healthcare Services' Hospital at Home program. Kholood Eid for The New York Times

After completing her examination of Romero, the first of her rounds that morning, De Pirro had a 30-minute drive ahead of her. On many days, she logs more than 100 miles around Albuquerque. She equips her car with her toothbrush, floss picks and eyeglasses in its center console. Her cupholder brims with a dozen pens. When De Pirro scrolls through her patients' electronic medical records, she doesn't just gather their clinical data; she also takes note of their home addresses and maps the most convenient routes between them.

During her drive, De Pirro fielded calls over her car's speakerphone from team members at patients' homes: A nurse practitioner wanted help prescribing a pain reliever; a pharmacist was trying to sort through someone's insulin regimen. Eventually De Pirro pulled up to a white trailer with green trim. Three barking dogs rushed toward her. De Pirro glided around them, patting their heads while strolling up to a tall thin man with long, dirty-blond hair and an empty holster on the right hip of his bluejeans. Bob Saltzman, who is now 59, preferred to sit outside during these hospital visits. While checking his vital signs, De Pirro asked him about his daily fluid intake. "I never drink water," Saltzman said. "I like Pepsis."

"Pepsi is not a very good way to hydrate for your kidneys," she said. "So, get some Gatorade. A little more fluid, you'll feel even better."

De Pirro plopped her computer on top of a barbecue grill, and as Saltzman talked, she typed, while also reviewing his blood tests. A few days earlier, he had been doing yardwork when he became dehydrated and overheated, then fainted. He was rushed to the emergency room, whirled through a flurry of tests and then hospitalized through De Pirro's program in his trailer home. After three days of treatment, his kidney function, which had been impaired by the episode, seemed to have mostly recovered. She planned to discharge him the next day, she told him.

Later that afternoon, Erica Guardiola, a nurse wearing scrubs and her hair in a ponytail, stopped by Saltzman's trailer to draw his blood and dispense another liter of IV fluid. Inside his tiny, cramped dwelling, a gun rested on his dresser, next to a coffee maker; a box of bullets sat on his bedside table, with a jumbo jar of peanut butter underneath. De Pirro was practical about situations like this. "This is New Mexico — a lot of people have guns," she told me earlier. "We can't tell people they can't have guns," though she added that they're not supposed to be out in the open when medical workers visit. De Pirro is not cavalier about her staff's safety, but she says firmly that in all her years of providing hospital-at-home services, she has "never had a problem — and we go into all kinds of neighborhoods."

Strewn around Saltzman's room were a 24-pack of Pepsi, a bag of pecans and a fantasy novel; Twizzlers wrappers filled the garbage can. What did you eat today, Guardiola asked, while she applied a tourniquet on his right arm in preparation for his blood draw. Oatmeal, he answered.

"Oatmeal is good, but you do need to eat a little bit more protein and food throughout the day to get the nutrition in your body," Guardiola said. She suggested that he eat more of his peanut butter, starting that evening. Saltzman nodded. She offered to get him some meal-planning booklets. A small light brown dog had nestled into a pile of his sweats. "She's always with me," he said with a grin.

Oxygen equipment for Roberta Thornton, another patient with pneumonia. De Pirro calls Thornton, who is 69, the "perfect candidate" for hospital-at-home because she is very active and cares for her young grandson. Kholood Eid for The New York Times

Guardiola prefers to care for her patients in this intimate way — by seeing how they live and being able to offer relevant advice, not just injecting them with medicines. "In the hospital, you're like hustle and bustle, moving from room to room," she says. "But here, we get to go into all different walks of life all over town and do a whole lot." Now, because of a serendipitous — or mercenary, depending on one's perspective — hand dealt by the pandemic, hospital-at-home services may soon be available to millions of Americans. Instead of being hospitalized, patients might be able to stay home, while doctors, nurses and other medical workers come to them, sometimes in person, sometimes virtually. "You see patients in their place of power, it's a totally different thing," De Pirro says. "That magical difference."

**The American health system** needs more hospital beds. This reality became terrifyingly palpable during the pandemic's worst surges, when I.C.U.s and other wards were forced to turn sick people away. In urban emergency rooms, admitted patients frequently languish for hours, sometimes even days, and occasionally in hallways, before they are moved onto inpatient floors. The situation can be more dire in rural areas; some communities may soon be left without any hospitals at all. In 2020, 19 rural hospitals were shuttered, more than in any year during the previous decade. Nearly 30 percent of all rural hospitals are at risk of closing, especially tiny, stand-alone facilities. These circumstances are likely to get worse as the baby-boomer generation continues to age, in part because of the staggering expense of hospital construction: A new 500-bed hospital can cost more than $2 billion in some cities. Health care in the United States is already more expensive than anywhere else in the world.

Hospitals aren't even the ideal places to heal, oftentimes. Infections spread among patients, occasionally with fatal results. The constant alarms and beeps made by all the monitors and machinery interrupt sleep and recovery. Older patients in particular become agitated and confused by the disruptions. Some patients have to go through rehabilitation afterward, having been confined to a hospital bed for so long. It's no wonder that both patients and clinicians alike might want an alternative to traditional hospital care.

De Pirro arriving at the home of Francis Rath, an 86-year-old with a serious leg infection. Kholood Eid for The New York Times

Presbyterian started its home-hospital after a 2005 paper in The Annals of Internal Medicine found its way to its executives' desks. The lead author, Bruce Leff, a geriatrician and professor at Johns Hopkins School of Medicine, successfully conducted a pilot trial in the late 1990s. (I met Leff later, when I was a medical student there.) With support from the John A. Hartford Foundation and the hospital leadership at Hopkins, Leff hospitalized patients in their own homes who were at least 65 and had been given one of a few straightforward diagnoses: a worsening of their heart failure, or emphysema, pneumonia or a bad skin infection. These patients did so well that Leff tried to spread the word by calling hospital leaders. "You kind of got the sense that people thought I had two heads," Leff told me.

Eventually he persuaded a few institutions, including a Department of Veterans Affairs medical center, to take part in a trial. The researchers found that patients treated in their homes had shorter stays of hospitalization and that their care cost about 30 percent less. Because Presbyterian, like the V.A., runs its own health plan, which covers the cost of some patients' medical services, it has more flexibility than many other hospital systems. With Leff advising, Presbyterian was able to open hospital-at-home for patients insured through its plan.

Other countries, including Australia, Canada and several in Europe, had already been experimenting with this practice, some of them extensively. In Australia, which has been running home-hospitals for decades, these services provided in Victoria alone are the equivalent of what a 500-bed facility could offer in one year. Overall, the patients treated in this way do just as well, if not better, in their homes.

The obstacles impeding Leff and other hospital-at-home advocates in the United States were bound up with America's labyrinthine health care system and particular medical culture. The Centers for Medicare and Medicaid Services (C.M.S.), which is the largest payer of hospitalizations, has required that nurses must be on site 24 hours a day, seven days a week, effectively keeping patients within the hospital walls. This matches how American society has come to regard hospitalization, too — nurses at the bedside, doctors making their rounds, in elaborate facilities pulsating with machines.

But Americans didn't always convalesce in hospitals. Before the 20th century, treatment at home was the norm. "Only the most crowded and filthy dwellings were inferior to the hospital's impersonal ward," the historian Charles E. Rosenberg writes in his 1987 book "The Care of Strangers: The Rise of America's Hospital System." "Ordinarily, home atmosphere and the nursing of family members provided the ideal conditions for restoring health." As Rosenberg puts it, "Much of household medicine was, in fact, identical with hospital treatment." As health care became more specialized and high-tech, however, diagnosis and treatment gradually moved into hospitals, and they evolved into institutions of science and technology.

More than five years after Presbyterian began offering its services, C.M.S.'s Innovation Center funded a $9.6 million, three-year study that enabled Mount Sinai to take its hospital into the Manhattan homes of its patients who were covered by traditional Medicare. These patients suffered from a broader mix of illnesses — including hyperglycemia, blood clots and dehydration — than those in Leff's original study. Albert Siu and Linda DeCherrie, geriatricians at Mount Sinai and two of the trial's leaders, bundled the hospitalization care with one month of post-discharge assistance. They ensured that patients got to their appointments, filled their prescriptions, underwent physical therapy if needed — the sort of follow-up services that patients sometimes forget or neglect after they leave the hospital.

The study, to which Leff contributed, showed that patients hospitalized at home were discharged two days sooner, with lower rates of E.R. visits and hospital readmissions, and that they were less likely to need rehabilitation afterward. They also gave their care higher ratings. Though C.M.S. recognized hospital-at-home as a worthy model, the agency didn't endorse it because it didn't immediately save billions of dollars, according to Harold Miller, the president and chief executive of the Center for Healthcare Quality and Payment Reform, who led the federal advisory subcommittee that evaluated the initiative. "We have the same old system we always have, and we didn't do anything that actually would have been desirable to do," Miller told me with regret. After the funding ended, Mount Sinai's program had to find a way to get more payments to sustain its services. At Hopkins, hospital-at-home was simply discontinued after the completion of Leff's 16-month pilot study.

But Leff, Siu and DeCherrie continued to push the idea. They partnered with David Levine, an internist at Harvard Medical School who started Brigham and Women's home-hospital program in Boston in 2016. Together, the four doctors created the Hospital at Home Users Group, to share lessons learned, hold webinars and organize conferences for health systems that were interested in their own initiatives. The intent was to spread hospital-at-home nationally, with the hope that it might eventually become a significant part of the American health care system.

The first steps in this direction had already been taken, with the proliferation of ambulatory surgery centers in the United States over the previous 50 years. These facilities showed that patients didn't have to stay in a hospital overnight, after all, following cataract surgery or a knee operation; they could recover in their own beds. Surgery there costs less than in hospitals, and as C.M.S. accepted more operations on its outpatient list, more centers opened. Recently, another important factor emerged: the spread of telehealth during the pandemic, which brought doctors into people's living rooms.

But the biggest catalyst has been the pandemic's brutal impact on hospitals. As Covid hospitalizations first swelled across the country, threatening to overwhelm hospitals, C.M.S. was forced to respond. In March 2020, it announced that medical facilities could move hospital-level care into clinics and ambulatory surgery centers, and even into hotels and dorms. That November, it went further, creating the Acute Hospital Care at Home waiver, temporarily allowing hospitals to treat patients in their own residences. "It was a quick decision based on: We need to take action. We need to put solutions on the table. The health care system can't wait, so let's try this," Seema Verma, the top C.M.S. administrator at the time, told me. "In absence of that, what were they going to do, right?"

In a matter of weeks, C.M.S. was able, with the help of experts, including some members of the Users Group, to come up with a waiver that reimbursed health systems as much for inpatient-level care in the home as in the hospital, even though room and board wasn't being provided. Nurses no longer had to be on site around the clock — only a minimum of two daily in-person visits by a nurse or a paramedic with additional training were required. Verma recalls no pushback. A handful of hospitals received the C.M.S. waiver immediately, including Presbyterian, Mount Sinai and Brigham.

Suddenly, Leff's phone was ringing off the hook with calls from hospital executives seeking advice. The Users Group helped some of them navigate the waiver-application process. Today more than 110 health systems, amounting to some 260 hospitals — or about 5 percent of the country's total — have obtained the waiver. (Geographically, the spread of home-hospital has been uneven; fewer than 10 rural hospitals have been approved so far.)

The pandemic conditions that propelled hospital-at-home programs in the United States may now be waning, but the movement itself is maintaining its momentum. According to the consulting firm McKinsey, up to $265 billion worth of care annually being delivered in health facilities for Medicare beneficiaries — a quarter of its total cost — could be relocated to homes by 2025. A recent report from Chartis, another consulting group, finds that nearly 40 percent of surveyed health executives intend to have implemented a hospital-at-home program in the next five years; only 10 percent or so of the respondents do not expect to develop any plan at all. When President Biden signed the $1.7 trillion omnibus spending bill at the end of December, the C.M.S. waiver became extended through 2024. Currently, no official rules limit what cases can be treated at home, so long as the care meets the same standard as inpatient care in the hospital wards, but the spending bill tasks the federal government with figuring out who should be hospitalized at home. In Leff's vision, that could mean almost everyone eventually, improbable as that seems now. He imagines that one day hospitals will consist only of E.R.s, I.C.U.s and specialized operating rooms.

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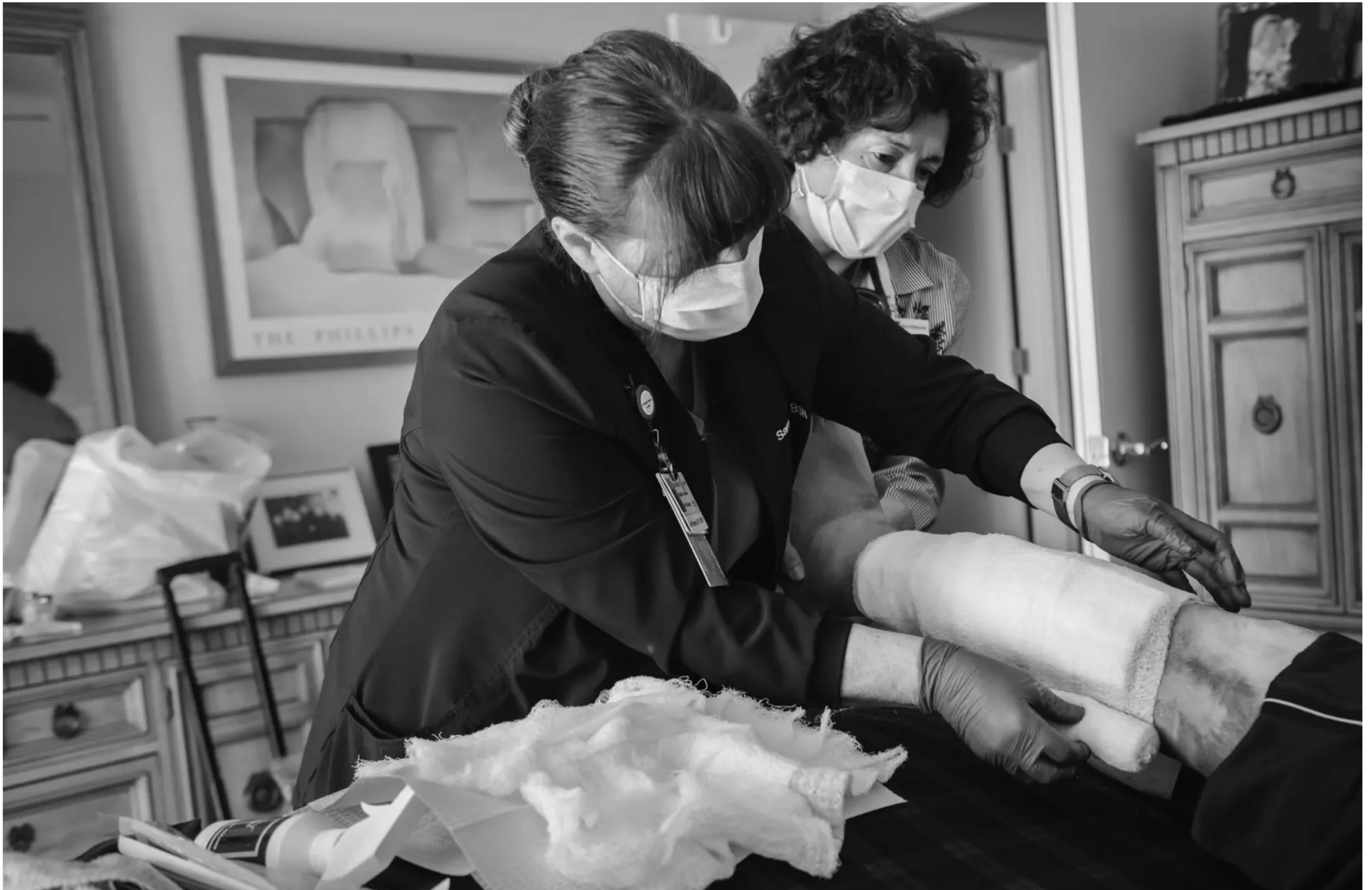

De Pirro with Sara Marquez, a registered nurse, in Rath's home. After De Pirro inspected the infection with the dressing removed, Marquez dispensed IV antibiotics and went through a multistep wound-care regimen. Kholood Eid for The New York Times

**"When hospitals build** a new building, they don't do it themselves," Pippa Shulman, the chief medical officer of Medically Home, told me. "We are the partner when you build a home-hospital." Medically Home, a private company that started in 2016, has contracts with about 20 organizations, many of them signed during the pandemic. The firm choreographs the movements of local staff and suppliers, so that tests and visits can be carried out in people's homes; if patients become too ill, they can be easily transported back to the hospital. Medically Home has created a technology platform to coordinate every step, so that — if everything is working right — a doctor will be able to make a computer entry and thereby prompt an action in the patient's home as if it were being performed inside the hospital.

An increasing number of companies like Medically Home have moved into the home-hospital business, among them Contessa, DispatchHealth and Sena Health. Some firms provide only technology, like video calls or remote monitoring. Others not only set up a hospital's operations but also manage insurance contracts; Mount Sinai needed reimbursements after its federal grant ran out, so it partnered with Contessa to deal with insurers. (DeCherrie, one of the doctors who led Mount Sinai's original trial, has since gone to work at Medically Home; Leff advises some of these companies.) Consulting firms are selling their expertise to health executives. Even private insurers are becoming more involved, not only to reimburse hospitals for the care at home but also to provide the services themselves, sometimes by working with start-ups to remove the hospital from the equation. Their clinicians meet patients in their homes before they ever step foot in the E.R., as De Pirro did for Manuelita Romero.

In April 2020, Medically Home's first hospital client, Kaiser Permanente Northwest — which, like Presbyterian, runs its own insurance plan — opened its hospital-at-home program. Because Oregon allows community paramedics to give in-home care, Kaiser Permanente is able to treat patients in that state using Medically Home's nurses who are working out of a virtual command center in Massachusetts. During a typical day, these patients can expect video calls with their doctor and nurse and in-person visits from a medic, who checks their vital signs and gives medication. Ultrasounds, X-rays, even echocardiograms can be done in the home. For certain problems, like wound care, nurse practitioners might trek out to a house. The nursing and doctoring remain mostly virtual, however, unlike the treatment given through Presbyterian; a Kaiser Permanente patient might be hospitalized in his home in Longview, Wash., while his doctor is in Portland and his nurse is in Boston.

De Pirro visiting with Rath. When not elevating his leg, he used his walker several times a day to go to the bathroom and eat in the kitchen. “In the hospital,” De Pirro says, “he would have just been in bed and gotten completely debilitated and would’ve likely ended up in inpatient rehab.” Kholood Eid for The New York Times

In this way, Kaiser Permanente has served more than 2,000 patients in Washington and Oregon; nearly 500 more have been treated in its California program, which began in late 2020. To put these numbers in perspective, Presbyterian’s hospital-at-home has cared for fewer than 1,600 patients since its debut 15 years ago. Kaiser Permanente needs to operate on a scale like this, according to its executives, to offset the substantial investment that went into starting its hospital-at-home program. “There is cost to getting these programs off the ground,” says Mary Giswold, the chief operating officer of Northwest Permanente. To cover them, Giswold explains, hospitals need to reach certain economies of scale. This may be another reason C.M.S. didn’t support hospital-at-home after the Mount Sinai study: To make financial sense, a hospital probably needs to treat at least 200 patients at home annually — a struggle for many places to reach at the time.

Making hospital-at-home cost-effective for health systems comes with a different kind of cost, though. A patient may never feel the warmth of her nurse's hand on her forehead, the reassurance of her doctor's stethoscope over her heart. During a video visit that I sat in on, involving Kaiser Permanente's program, the only glimpse I caught of the patient's home was a bottle of Tums and a mug on her side table — a far cry from what De Pirro is able to see on her rounds. When the patient noted some lower abdominal pain, the doctor couldn't reach through the screen to examine her; instead, he had to rely on a medic's report. Arsheeya Mashaw, the medical director of Kaiser Permanente at Home for the Northwest, recognizes the trade-offs. "Although I'm sacrificing that bedside interaction with the patient," Mashaw told me, "I'm also increasing the amount of patients I can see a day to provide that better care in home to the patient, which kind of makes up for the losses."

Critics fear that hospital-at-home may exclude those who are already marginalized — or, at the other extreme, become the only option available to those who can't pay for their care. Both outcomes have the potential to worsen health disparities. "We would never not take somebody on because of the living conditions," De Pirro told me, unless those were dangerous — a broken heater in winter, signs of domestic violence. At Mount Sinai, patients in public housing were not only accepted into its trial; the staff took steps to address some of their other needs, like finding ways to help them afford groceries or setting up transportation services, which might otherwise have been overlooked had the patients been in a hospital room. So far, Kaiser Permanente's program has served a broad socioeconomic range. The recently passed federal spending package pledges to study the demographics of the people receiving this care.

Institutions also need to figure out how best to deliver these services to them. Today the care varies widely, from Presbyterian's in-person visits to Kaiser Permanente's mostly virtual model. One program might send staff to check vital signs twice a day. Another might provide round-the-clock remote monitoring through wearable technology, which worries some doctors. "If a patient makes you nervous, and you think you want any kind of telemetry" — the continuous measurement of heart rate and rhythm — "they shouldn't be home," De Pirro says. "Because the reality is if something goes wrong, what do you need to do? By the time you get them anywhere, you're talking 20 minutes realistically."

Some health workers cast a much harsher light on hospital-at-home's unknowns. "How do we learn that a program about somebody's life and health isn't working? That means people were injured, or people died?" asks Michelle Mahon, the assistant director of nursing practice at National Nurses United, the largest nursing union in the United States. It strongly opposes hospital-at-home, referring to it as the "home all alone" scheme and claiming that, in the words of the union's president, "nurses and other health professionals cannot be replaced by iPads, monitors and a camera."

In the union's view, the health care industry is seeking to exploit the pandemic for financial gain by trimming away in-person care through hospital-at-home. Hospital executives should improve working conditions and increase nurse-to-patient ratios, Mahon says, not shift care to people's homes. "The answer isn't to send in less-skilled workers, who happen to also cost less," she says, referring to community paramedics. (A nurse's salary can be double what a medic earns.) Medics do not care for patients on the wards, Mahon says, so they shouldn't do so in the home, either.

While the underlying cost of caring for patients in their own homes may be cheaper, the path to profit is not swift or straightforward. Health systems, especially those that are also insurers, may eventually see sizable revenue from providing care at home. But currently, "it's not as if it's a cash cow and hospital systems are making tons of money," says Amol Navathe, a health-policy professor and internist at the University of Pennsylvania, where he is co-director of the Perelman School of Medicine's Healthcare Transformation Institute. That's because of the significant upfront investment and the likelihood that reimbursement rates will go down. Instead, Navathe says, "hospital adoption of hospital-at-home is playing defense, in a sense" — against shifting rules for reimbursement, evolving expectations among patients and start-ups that encourage people to bypass hospitals' front doors altogether.

"The model is feasible, the potential is astronomical," Navathe says, but how it fits into the American health care system is still "in the early days." He warns in particular that single-payer countries' successes may not be replicated in the United States, which tends to be "much more complicated and uses a variety of different fragmented stakeholders." And he adds that he is skeptical that what is meant by hospital-at-home in the United States is the same as what is meant in other countries. In Australia, for example, iron infusions could qualify, but patients would not be hospitalized for those treatments in the United States. Even successful U.S.-based trials may not translate into real-world applications. Though the home-hospital patients in Mount Sinai's trial did better than the inpatient subjects, they also had 30 days of aftercare that their counterparts did not get. And self-selection is a part of these studies; patients who go home choose to go home.

Still, the health systems that have already put money into this are not likely to abandon their investments any time soon. Kaiser Permanente and the Mayo Clinic jointly made an initial investment of $100 million in Medically Home; the three organizations have also started a coalition to advocate making the C.M.S. waiver permanent. As part of a state-mandated performance-improvement plan, Mass General Brigham is counting on an annualized savings of $1.3 million to come from its home-hospital expansion. It may just be that the biggest doubt about hospital-at-home is not its survival but whether it can preserve its identity as it is amalgamated into the American health care system.

Jody Vandock, 88, has been hospitalized multiple times for diverticulitis, an infection in the intestines, over the years. During a recent home-hospital stay, a severe allergic reaction to an antibiotic forced her back to the hospital, where "she did not want to go at all," De Pirro says. After several days there, she returned home to finish the rest of her treatment. Kholood Eid for The New York Times

"One of the things that I fret about as we try to hold hospital-at-home closer to hospital standards," says Albert Siu of Mount Sinai, "is that we don't want to recreate the hospital environment now in the home" — one in which Manuelita Romero's walls are plastered with infection-control signs instead of her cherished religious relics, her fridge's temperature adjusted for antibiotics instead of her vegetables, or one in which Bob Saltzman is restricted to the tiny space inside his trailer instead of his favorite spot outside. That, Siu warns, would "decrease some of the good things that we're trying to accomplish with hospital-at-home."

**In September, Rita Nelson,** who is now 87 and lives with her niece's family, was hospitalized for sepsis at Appalachian Regional Healthcare's hospital in Hazard, in eastern Kentucky. After a week in the hospital, Nelson, who suffers from dementia, was not doing well. Her blood work had mostly returned to normal and she hadn't spiked a fever in days, but she was more confused and hadn't gotten out of bed in a week. She barely touched her meal trays. Her niece, Susan Johnson, wanted to take her home, but Nelson was still sick. Anywhere else in Kentucky, she would have had no alternative to staying in the hospital, but the medical center is part of a clinical trial being conducted by Harvard that enabled her to finish her treatment at home.

In June, A.R.H., which includes 14 hospitals in Kentucky and West Virginia, rolled out a home-hospital trial at its largest site, a 300-plus-bed medical facility in Hazard, initiated by David Levine, the Brigham doctor. For more than a year, Levine and his team at Harvard's Ariadne Labs helped A.R.H. set up its operation by sharing sample work flows, giving feedback on the protocols that A.R.H. staff members developed and guiding them through the process of applying for a C.M.S. waiver — which, he admitted, "is a very intimidating thing for rural hospitals." A.R.H. also contracted with a company called Biofourmis to supply wearable monitoring devices. (Levine developed some of this technology, so his research lab may reap future royalties.)

When the ambulance took Nelson from the hospital to her niece's single-story, white stone house, situated on a very steep hill off a main road, two nurses, Valerie Frazier and Megan Lewis, were waiting in their Jeep outside. A hospital bed had already been delivered. As Nelson, pale with her steel blue eyes half-closed and crumpled on her side on a stretcher, was rolled into the house, the nurses unloaded their gear. They wheeled in a large yellow box, along with a black one; next, they brought in an oversize backpack and, finally, bottles of vanilla-flavored nutritional shakes piled on plates of food. A hefty emergency kit remained behind in their vehicle. According to Tammy Fugate, the program's nursing director at the time, most nurses need about half an hour to settle new patients into beds on their hospital wards, but creating a hospital room in the home could require two hours.

Immediately, Frazier had trouble making the wireless interconnection between Nelson's Biofourmis patch and an iPad-like tablet. The patch, which resembles a slim flat bow tie and is affixed to one's chest, monitors heart rate and rhythm, breathing, temperature and movements. This data would be sent continuously in real time through a tablet to her entire team, which included all her nurses, as well as her doctor and a nurse practitioner from the hospital. At night, Biofourmis's nurses would monitor her remotely; A.R.H. didn't have nurses to spare — nearly half of them were temps on travelers' contracts — so they paid extra to Biofourmis for this service.

Frazier peeled Nelson's patch off, folded it into her pocket, then applied a new one. Unable to link it to the tablet, she finally called Biofourmis's tech-support team, which helped her go through the family's internet connection instead. Wi-Fi can be mercurial in Appalachia and other rural areas, so mobile wireless broadband is also on hand as a backup, if a patient's residence lacks a connection.

Infrastructure and geography are always more troublesome in rural places. Appalachia's "hollers" — the hollows, or narrow valleys between mountains — can be tough to traverse even in favorable weather. When catastrophic floods hit the region in late July, the A.R.H. program had to stop for six weeks. "We tried to take some patients home, and there wasn't a home to take them to," Fugate says. As Frazier puts it: "How can you safely care for somebody in their home if they have no water? If they have no electricity?"

Soon after the patch and the tablet were connected, Nelson's IV stopped working. Her niece worried that she would need to return to the hospital. It took several pokes for Lewis to place a new IV in her right arm.

A few minutes later, the tablet and Frazier's phone started ringing: Did Nelson fall down? Because Frazier had folded the Biofourmis patch into her pocket, an alert had been sent out. Three people immediately checked in: the nurse practitioner, a Biofourmis nurse and the nurse coordinator for the trial.

This oversight continued throughout the night. Around 9:30 p.m., Johnson received a video call on the tablet from a Biofourmis nurse. Nelson's breathing rate had gone up — was she OK? (She was moving from the sofa to her bed. Everything was fine.) Then, close to 2 a.m., Johnson's phone buzzed; Nelson's heart rate had dropped — how was she? (She was sleeping comfortably.) Though the tablet was in Nelson's bedroom, only Johnson's phone rang, so as not to awaken the patient. "It made me feel more secure, that's how close they were monitoring her," Johnson said. "I can sleep easier now because if she moves, I know they're going to know it."

Early the next morning, when Lewis returned, Johnson opened the door in her pajamas. Before she could say anything, Lewis acknowledged Nelson's slow heart rate overnight. She reassured Johnson that she thought Nelson was fine, but she would check with the doctor. Lewis asked if Nelson ate dinner. "Lord, let me tell you," Johnson replied, before rattling off Nelson's meal: chicken, hush puppies, coleslaw and an ice-cream bar. Johnson was very pleased: "She had hardly eaten nothing in the hospital."

Nelson was still asleep, her bed warmed by a heating pad that her niece had slipped underneath the covers. Family photos of Nelson's parents and her 14 brothers and sisters lined a nearby desk. "Where am I?" she asked when she awoke, rosy-cheeked. Sometimes she thought she was in the hospital; sometimes she thought she was in her old house in Michigan.

For the first time since she fell ill, Nelson sat up by herself in bed, then took a few steps using her rolling walker. She climbed onto the kitchen counter stool with Johnson's help and took her coffee piping hot, the only way she'll drink it. With her niece's encouragement, she also sipped a nutritional shake. In the hospital, she didn't want to eat, Johnson intuited, because the whole family was unable to convene there for meals. Nelson offered her own explanation: "You don't need to eat a lot of stuff when you just lay."

Lewis listened to her heart and lungs and gave her IV antibiotics. She would be back that evening; she would monitor Nelson in the meantime through the patch. "If you need anything beforehand," she told Johnson, "you just call us, OK?"

When Nelson's blood pressure ran high on another day, Frazier already had the remedy ordered by the doctor — it was in the emergency kit in her car. Later, Lewis inspected Nelson's feet, scanning for the pressure ulcer that had started to form on her left heel during her stay in the hospital. But it was no longer pink and seemed to have vanished. "Not saying the hospital wasn't taking care of her," Johnson said — but she just knew her aunt would do better at home.

Most rural Americans, though, won't be getting hospital care at home any time soon. In addition to the $190,000 funding from the Harvard study, A.R.H. put in close to a million dollars to jump-start its operations. Its hospital in Hazard is big and part of an even bigger system, which all but ensures its economic viability. For a tiny rural hospital at risk of closure, keeping its doors open while also caring for patients at home is not realistic, according to Harold Miller, the Center for Healthcare Quality and Payment Reform president, who has extensively

De Pirro and Lori Morgan, a registered nurse, treating Vandock. “She was 100 percent happier at home with her dogs, which is very therapeutic for her,” De Pirro says. Kholood Eid for The New York Times

studied and been consulted on rural hospitals. “If they don’t have enough patients to make an inpatient unit viable, they sure as hell don’t have enough to make a hospital-at-home program viable.” He adds, “Why you have a hospital to begin with is because you can manage more patients in a hospital than you can in multiple home sites, and the farther apart those homes are, the more challenging it is.” That describes the landscape of much of rural America.

The same staffing frustrations that trouble rural hospitals are only magnified when care moves into homes. Fugate learned how arduous it can be when she hired six separate nurses, and every one of them failed to show up because they got better offers or realized they didn’t want to be in patients’ houses after all. Nurses aren’t the only workers in short supply. If paramedics fill in, then a rural community may not have anyone to respond to 911 calls. For small rural facilities, hospital-at-home “would be cost-prohibitive, human-resource-prohibitive,” says Maria Braman, A.R.H.’s chief medical officer, now that she’s had experience building one. “They’re barely making it,” she says. “Taking on a project like this would be impossible.”

For now, it seems hospital-at-home will share the fate of American health care generally: It’ll go to where the money is. From multibillion-dollar medical centers, hospital-at-home will flow to those in metro areas, cities and towns, eventually making its way to patients near larger rural hospitals and then — maybe, if ever — trickling down to the people who, cruelly, already live the farthest from any hospital. What would it take to redirect this path? “If we as a society think that hospital-at-home services are in fact desirable,” Miller says, “then they need to be paid for and covered — at whatever the cost of it is.”

That evening, in Hazard, Nelson, her snow white pixie hair coifed, sat on the couch in a cable-knit cardigan with Johnson and her husband, another niece and a grandniece gathered around her. The nightly news hummed from the TV. The savors from a supper crackling in a frying pan drifted in from the kitchen. The dog hopped onto Nelson’s lap. Nelson didn’t ask where she was.

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