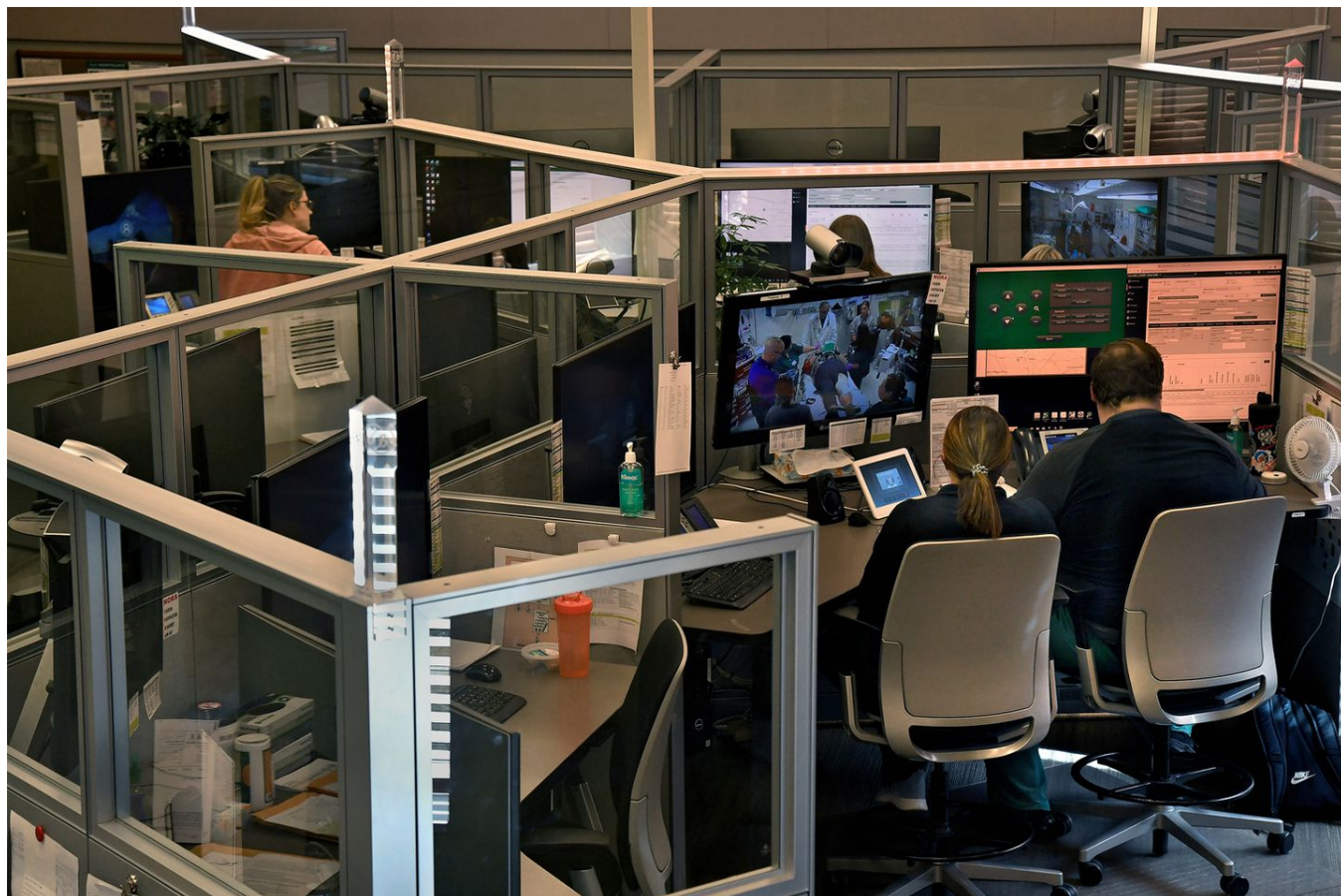


# The most remote emergency room: Life and death in rural America

[Eli Saslow](#)



Avera eCare employees sit at virtual emergency room workstations at a telemedicine center in Sioux Falls, S.D. (Michael S. Williamson/The Washington Post)

SIOUX FALLS, S.D. — A flashing red light summoned Dr. Brian Skow to his third emergency of the afternoon, and he hurried to a desk in a suburban office building. He sat in front of an oversize computer monitor, which showed a live video feed from inside a hospital room in eastern Montana. Two nurses were leaning over a patient on a stretcher, checking for a pulse, and squeezing oxygen out of a bag and into the patient's lungs.

"I'm Doctor Skow," he said, waving into a camera attached to his computer, introducing himself as the presiding emergency physician even though he

was seated more than 700 miles away. "How can we help you today?"

"We have a female patient, comatose and unresponsive," one of nurses in Montana said. The nurse was short of breath, and she looked up at the camera mounted to the wall of the exam room as she attached monitors to the patient's chest. "She's a known diabetic. Blood sugar over 600. I — I don't really know. I haven't seen a whole lot of this."

"You're doing great," Skow said. "We'll walk through it together. That's why we're here."

As hospitals and physicians continue to disappear from rural America at record rates, here is the latest attempt to fill a widening void: a telemedicine center that provides remote emergency care for 179 hospitals across 30 states. Physicians for Avera eCare work out of high-tech cubicles instead of exam rooms. They wear scrubs to look the part of traditional doctors on camera, even though they never directly see or touch their patients. They respond to more than 15,000 emergencies each year by using remote-controlled cameras and computer screens at what has become rural America's busiest emergency room, which is in fact a virtual ER located in a suburban industrial park.

At the cubicle to Skow's left, another doctor was examining a head injury in Kansas. To his right, a physician monitored a possible heart attack at a critical-access hospital in Minnesota. Meanwhile, Skow used a remote control to move the high-resolution camera in Montana, zooming in to check the patient's pupils for dilation and using a microphone to listen for breathing sounds.

"If she's in respiratory failure, we need to take over her airway," Skow told the nurse. "Let's get all hands on deck."

He watched on the monitor as a few more nurses and a physician assistant came into the hospital room to prepare for an emergency intubation. They

needed to insert a tube down the patient's throat to put her on a ventilator, but first that would require sedating and temporarily paralyzing her with medication, which meant she would no longer be capable of breathing on her own.

"Let's get her down nice and hard," Skow said, instructing the nurse to give the sedative first and then the paralytic. He zoomed in to check a bedside monitor that showed the patient's oxygen level at 100 percent and then switched over to another camera adjacent to the breathing tube that allowed him to see down the inside of the patient's throat.

"So there's the epiglottis," he said, directing the nurse as she tried to navigate the breathing tube past the tongue and into the windpipe. "There are your vocal cords. You've got a nice view right there. Do you see it?"

"There's a lot of blood in the airway," the nurse said.

"Yeah, I see that, too," Skow said. He switched to another camera to check the patient's oxygen level on the bedside monitor and watched as it dropped to 95 percent, 93 percent, then 90. If the patient were deprived of oxygen for too long, it could cause permanent brain damage or heart failure. He switched back to look down the patient's throat. "Can you advance a bit further?" he asked the nurse. "You've almost got it. Just an inch?"

He watched the nurse maneuver the breathing tube as he drummed his fingers against his knee. During his own bedside shifts at the hospital in Sioux Falls, a city of 180,000, Skow had performed dozens of similar intubations under what he had come to think of as the standard conditions of an urban trauma center. He usually had another emergency physician nearby to provide backup, plus a trauma surgeon, a cardiologist, an anesthesiologist, and a team of up to 20 residents, ER nurses, and paramedics competing for space at the patient's bedside. But now on the screen in rural Montana, Skow counted a total of five people in the room. None were doctors. None had significant experience performing emergency

intubations.

He moved the camera again to check the patient's oxygen level. Eighty-five percent. Seventy-six and dropping faster.

"Let's bag up and give it another shot," he said, instructing the nurses to pause the intubation and squeeze air by hand into the patient's lungs. Skow asked them to try intubating again with a smaller breathing tube, and then he looked again through the camera into the patient's throat.

"You're right at the cords now. Can you advance just a bit?" he asked, inching his hands forward to demonstrate as the nurse did the same.

"Yes. That's it!" he said, watching as the tube slid into position and the oxygen level began to rise. One of the nurses at the bedside looked up at the camera and gave a thumbs up. "Thanks," she said.

"That's all you," Skow said. "I didn't even touch her."

If anything defines the growing health gap between rural and urban America, it's the rise of emergency telemedicine in the poorest, sickest, and most remote parts of the country, where the choice is increasingly to have a doctor on screen or no doctor at all.

The number of ER patients in rural areas has surged by 60 percent in the past decade, even as the number of doctors and hospitals in those places has declined by up to 15 percent. Dozens of stand-alone ERs are fighting off bankruptcy. Hundreds of critical-access hospitals either can't find a doctor to hire or can't afford to keep one on site. Often it is a nurse or a physician assistant left in charge of a patient, and for the most severe cases many of them now hit a red button on the wall that connects directly to Sioux Falls.

In less than a decade, the virtual hospital has grown from a few part-time employees working out of a converted storage room into one of the country's most dynamic 24-hour ERs, where a rural health-care crisis plays

out on screen. Each month the monitors show an average of 300 cardiac episodes, 200 traumatic injuries, 80 overdoses and 25 burns. There are patients suffering from heat stroke in South Texas and frostbite in Minnesota — sometimes on the same day. There are drowning deaths in summer, gunshot wounds during hunting season, car accidents on icy roads, and snakebites in spring.

And now there was a video call coming into the office park from the latest hospital to seek virtual help, a critical-access facility in Onawa, Iowa, which had just finished installing its cameras a few hours earlier.

"Are we live?" asked Karla Copple, the hospital's director of emergency services. She stood in an empty hospital room in Onawa, a farming town of 3,000 on the Missouri River, and looked up at a screen on the wall.

"Yes, I can see you," said a nurse at the virtual hospital. "How are you today?"

"Just making a test call," Copple said. "It's all working?"

She had been trying to set up a partnership with the virtual hospital for the last year, ever since a car crash in Onawa sent four patients to the ER in critical condition when there was only one registered nurse on site. The hospital had a few doctors on staff, but they usually commuted into Onawa from their homes in Omaha, which was an hour away.

"In emergencies, every second counts!" read an introductory brochure from the virtual hospital, and Copple began researching telemedicine and sharing data with her staff. Doctors at the virtual hospital could begin treating a patient an average of 21 minutes faster than doctors on call, who often lost time driving from home to the hospital. Telemedicine helped hospitals retain and recruit doctors because it gave them more support and allowed for more time off. It also allowed hospitals to treat more patients on site rather than having to transfer them to bigger facilities, resulting in increased billing

charges and more hospital income.

Late in the summer, Onawa had signed a subscription deal with the virtual hospital for the standard annual rate of about \$70,000 per year. A charitable foundation offered to pay \$170,000 to help cover initial equipment and technology costs, and an IT crew spent the next months outfitting two trauma rooms with fiber-optic cables, cameras and a microphone over the exam table, which Kopple was talking into now.

"You can hear me?" she asked.

"Loud and clear," the nurse said. "We can hear you from anywhere in the room. These microphones are amazing."

"Okay then," Copple said. "Next time it'll be for real."

There are 15 doctors and 30 emergency nurses who rotate through shifts at the virtual hospital, and while all of them have trained for years inside regular ERs, nothing compared to the intensity of the industrial park. During one 24-hour shift, they often saw more critical cases on screen than most ER doctors encountered in a month: an average of one severe heart attack each shift, one suicide attempt, two pediatric emergencies, three traumatic injuries, four intubations, and five patients whose hearts had already stopped beating and needed immediate resuscitation.

"Do you feel a pulse?" Dr. Kelly Rhone was asking into the camera one morning, as she watched a team of nurses perform CPR on a middle-aged cancer patient at a small hospital in North Dakota. The patient's shirt had been ripped in half, and his body shook from the force of the CPR compressions.

"Pulse?" Rhone asked again.

"I don't have one," a nurse said.

"Fixed and dilated," the nurse said.

"Okay. Let's do one of epi," Rhone said, instructing them to inject the patient with epinephrine, a medication used as a last resort to restart the heart. She zoomed in on a camera to look at a bedside monitor of the patient's vital signs and counted off the seconds using a clock at her desk. An emergency nurse sat next to her in the office park and worked on a separate computer to arrange for helicopter transport to a trauma center, in case the patient's heart started beating.

"Nice CPR," Rhone told the nurses in the room. "You're doing great."

"I'm going to go talk to the wife," one of the nurses said to Rhone, pointing toward the hallway. "She's kind of hysterical. Any update you want me to give her?"

"Just that we're still working on it," Rhone said, even though she already suspected how this would end. There was statistically almost no chance the patient could be revived after several minutes without a heartbeat. "Tell her we're doing everything we can."

She ordered another injection of epinephrine and watched as the nurses injected him. She called out for another pulse check, and watched as the nurses in the room found none. She zoomed in to see the patient's cardiac monitor and saw a flat line indicating no cardiac activity. "Eight minutes since arrival," she told the nursing staff, as they continued CPR. "Twelve minutes since arrival," she said. "Would his wife like a chance to come in?"

She believed one of the worst things she could do was withdraw care too quickly. Even if she already knew the patient was dead, she wanted the medical staff in the room to come to that realization on its own time. The hospital served a community of fewer than 2,000, which meant someone on the nursing team probably knew the patient personally. Rhone wanted staff members to feel they had done everything they could.

"Fifteen minutes since arrival," she said, hoping to urge them toward a decision, and after another moment a few of the nurses stopped administering CPR, stepped back from the bed and went into the hallway to get the patient's wife. Rhone watched her come in and kneel at the bedside. She watched as the wife gripped her husband's jeans and buried her head into his chest. "Oh, God. That's it. That's it," the wife said, as Rhone pushed her chair back from the computer monitor and checked the clock on her desk.

"It's 11:06 a.m.," she said quietly, speaking to one of the nurses in the room, so she could mark that down as the official time of death.

She watched as a paramedic pulled a white sheet over the patient's body. Everyone in the room circled around the bed, and the wife started to pray. Her prayers turned to cries and her cries became louder, until after a few seconds the camera felt to Rhone like an intrusion, and she reached to her desk and switched the monitor off.

"Is that TV talking?" asked Silas Gruen, age 4. He adjusted his glasses and sat up on his hospital bed in Abilene, Kan., looking at a television screen mounted on the wall. He could see a woman in blue scrubs smiling at him as she typed into a keyboard.

"I think that's actually your doctor," said his mother, Amy.

"Well, kind of," Amy said, but before she could explain more the doctor on TV was talking again.

"So what exactly brought you in here today?" the doctor asked.

"You mean in here?" Amy asked, pointing down at the floor of the only hospital within 40 miles of her house, where she knew many of the employees. A sign near the doorway read, "Local Care Is Loving Care," and soybean fields stretched in neat rows out the window. There was no doctor



on site at the hospital during the day, so a physician assistant was attaching monitors to her son's chest and pricking his finger for a blood sample while a nurse tried to distract him by offering a juice box.

This was the first time Amy had seen a virtual doctor in the ER, but at the moment she was more concerned about what had been happening that morning. She took a step closer to the screen and explained that Silas had woken up with nausea and a fever — common symptoms that concerned her because of his complex medical history. He had been born with a cleft lip and an eye condition, which meant they traveled every few months to find the specialized medical care that didn't exist in most rural areas. Silas's primary-care doctor was an hour away. He had regular appointments with specialists across the state. Already this morning, Amy had taken him to a walk-in clinic and then to the hospital, where a physician assistant who saw him had pushed the red button.

The doctor on the screen introduced herself as Katie DeJong. She said she could see on the bedside monitors that Silas's blood sugar was dangerously low. She asked the physician assistant to give him medication and a chest X-ray, and then she turned her attention back to Amy, who was holding her son's hand and sitting on the edge of his hospital bed.

"What do you think, Mom?" she said. "What's your intuition?"

"He doesn't seem like himself," Amy said. She watched DeJong take notes on the screen. All Amy could see was a doctor, a nurse, and a blank yellow wall behind them. "Where are you, anyway?" she asked. "Kansas City?"

"Actually, South Dakota."

"Yep. Believe it or not."

Amy rubbed Silas's back and waited for DeJong to finish her evaluation.

"My concern here with the blood sugar is we don't know what's causing it,"

DeJong said. She explained that Silas needed further blood testing, specialized scans and maybe even an endocrine specialist — none of which was available at the moment in Abilene.

"I would definitely go ahead and transfer this," DeJong said to the physician assistant in the room, and a little while later Amy and Silas were riding through soybean fields in an ambulance on their search for adequate medical care again, as a new wave of emergencies took their place on the monitors in Sioux Falls.

A farmer had fallen into a grain elevator and injured his head.

A drug addict was foaming at the mouth and turning blue.

A woman with pneumonia and a life-threatening sepsis infection was lying motionless on her hospital bed as her oxygen levels dropped.

"Who is our most experienced emergency provider in the room?" DeJong asked, speaking to five staff members surrounding the patient with sepsis, who was rolling her head from side to side and had signs of a possible brain bleed. They needed to protect her airway by inserting a breathing tube.

"Who has the most experience to perform the intubation?" DeJong asked again, louder this time, and finally a nurse stepped away from the bedside and looked up at the camera.

"Great," DeJong said. "That's terrific."

She moved her camera around the hospital room, zooming into cabinets and drawers to help point out necessary supplies for the staff to gather at the bedside. She ordered them to give the patient a sedative and then a paralytic. Then she held up her fingers to the camera to demonstrate the best technique for intubation.

"You're doing great," she said, as she watched the nurse try to insert a

breathing tube for what DeJong could tell was probably the first time. The nurse leaned over the patient's throat, twisting the tube back and forth without advancing it down the airway.

"I'm not exactly sure what I'm seeing," the nurse said.

"No problem," DeJong said, as the patient's oxygen levels began to drop on the bedside monitor. "Let's bag up and try again."

"I still can't seem to advance it through," the nurse said, on a second attempt, as the patient's oxygen level dipped again.

"That's okay," DeJong said. "This is hard. Is there a more experienced provider who wants to make our next try?"

"I think I almost had it," said the more experienced provider, after taking over and failing on the next attempt. They had been trying to intubate for 15 minutes. A nurse stepped away from the bedside and rubbed sweat from his head. "We're doing fine," DeJong said. "We just need to focus on technique." She held up a pencil and pretended it was a breathing tube to demonstrate. She tilted her neck to show the proper position of the patient's head.

They began another attempt as she moved the camera around the hospital room, hovering over the patient's throat and zooming in on the oxygen levels, pushing the boundaries of technology and bumping up against its limitations. She wanted to reach into the screen. She wanted to be at the bedside. She wanted to be using her own hands to intubate, but instead she was 400 miles away, and for the moment all she could do was remain calm and reassuring as she pressed in closer to the monitor.

"You're doing great," she said, as the tube began to slide into place. "You're giving the patient everything you can."