DANCING 
ON AIR
BY JOHN E. CASTALDO, M.D.
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I don’t have paralysis. I just fell out of my car.”

“Why, I’m Irene Polosky, and I am 86 years of age,” she said, shocked to hear her usually distinct voice coming out as a thick, drunken slur. “It’s a real pleasure to meet you boys, but I’m okay, really. How’d you get here so fast, anyway?” Irene inquired.

Jerry and Bill exchanged wry grins, conscious of their growling stomachs and the hot food rapidly growing cold at their table.

“Mrs. Polosky, we need to get you to a hospital right away,” Bill said. “We think you’re having a stroke.”

“A stroke, you say?” Irene said dubiously. “Isn’t that when you have paralysis of an arm or leg? Boys, I don’t have paralysis. I just fell out of my car.”

But Jerry had already lifted the expandable gurney off the back of the ambulance and was wheeling it over to Irene. Within minutes, the men had wrapped her in blankets, strapped her in, and fitted her with a breathing mask that delivered 100% oxygen. Once she was inside the vehicle, Jerry worked feverishly to start an intravenous solution of salt and water in Irene’s left arm, hoping it would help flush out the blood clot that was likely blocking one of her arteries.

Meanwhile, Bill took the steering wheel and clicked the switch that set the sirens screaming and strobe lights flashing. Picking up the shortwave as he sped through the streets, he called Lehigh Valley Hospital’s Emergency Department. “We’re transporting an 86-year-old woman with an acute stroke . . .”

My morning at the hospital had started like any other. “Dr. Castaldo, your 7:00 meeting will be in Dr. Payne’s office,” my secretary said as I rushed into my office at 6:58, a Starbucks cup in one hand and a bulging briefcase in the other. Following that early meeting with my partners to discuss our cases, I had a full day ahead of me. I was scheduled to see some 20 inpatients—reviewing their radiology films and blood tests, examining them at the bedside, writing up progress notes, and creating an action plan for each one. Then there was the usual bedside teaching of medical students and residents, as well as calls to make to patients’ families to give them updates. I was already feeling a bit frazzled but told myself that as long as nothing unexpected occurred, I’d be able to stay on schedule.

I’d made about a third of my rounds when I heard the familiar ring of the red cell phone I carry in my white coat. As I reached for the phone, my beeper went off, too. Snatching it from my belt, I read the “alpha,” or urgent, message: “STROKE ALERT ED 15 MIN.” My heart sank. I knew that diagnosing and treating a stroke case could take hours, and that by the time I caught up with my other work and got home I’d probably have missed supper with the kids—again.

But I knew the Stroke Alert drill well. I could almost hear pages going off all over the hospital—to the CT technicians, the radiologist on call, the intensive care unit residents, the blood lab technicians, and the stroke team nursing staff.

I flipped my phone open and barked into it, “Castaldo.”

“Hey, John, it’s Rick in the ER.” His voice was far more upbeat than the message I knew he was about to relay. “We have a Stroke Alert on its way. Wild story. Apparently the ambulance crew was having breakfast at Allen’s when they witnessed an 86-year-old woman keel over in the parking lot. Sounds like she had a big stroke just 15 minutes ago. She should arrive here sometime in the next 15 minutes. Sounds like you’ve got a good candidate for your clot-buster, tPA.”

“Gee, I don’t know, Rick,” I replied. “Eighty-six is getting up there for using tPA.” Tissue plasminogen activator, or tPA, had been approved by the Food and Drug Administration for treating strokes and was known to be a powerful clot-buster, but it hadn’t been tested yet in patients older than 79. The drug was also known for its high complication rate—producing uncontrollable, often fatal brain hemorrhages in 6% of patients who received it.

“Going with tPA is your call, John,” said Rick. “In any case, expect her here 30 minutes out from symptoms.”

I hung up, excused myself from the rounds team, and headed directly to the ER. When I arrived, Claranne and Joanne, two seasoned stroke nurses, were already calling the pharmacy, the CT unit, and the blood lab to make sure they’d received the Stroke Alert page. We were a well-oiled machine, but I could still feel the muscles tighten in the back of my neck. In a few minutes, I would have to ask an 86-year-old woman for permission to inject into her veins a drug that might save her life. Or that might instantly kill her.

Minutes later, Jerry and Bill wheeled Irene in. She was bundled up like a baby, her face bright pink from breathing the supplemental oxygen. In sec-
onds, many hands were upon her. She was removed from the gurney and placed on a hospital stretcher. The nurses quickly removed Irene's clothes and dressed her in a gown, then started another intravenous line and a Foley catheter to drain her urine. Meanwhile, blood was drawn from her forearm and sent off for immediate analysis.

I bent down toward her. "Mrs. Polosky, my name is Dr. Castaldo," I said gently. "I am a neurologist who cares for folks who have had a sudden paralysis such as yours."

"Pleased to meet you, Dr. Castaldo," smiled Irene, her gracious manner at odds with her stuttering slur. "Have I had a stroke?"

"Well, let's take a look here," I replied.

As I examined Irene, I discovered that her face was densely paralyzed on the left side and that she was blind in her right eye. Her left arm and leg were also paralyzed, and she was unable to feel anything on the left side of her face and torso, or in her left arm and leg. When I asked her to move her right side, she did so easily. But when I asked her to move her left arm, she lifted her right arm. "Like this?" she asked.

"No," I replied. "Try moving this hand." Gently, I picked up her left arm and put it on her belly.

"Why, that's not my arm," she replied, slightly indignant.

"Whose arm is it then, Irene?" I asked.

"Why, Dr. Castaldo, you're playing games with me," she slurred. "That's your arm."

Carefully, I turned her head so she could follow her arm back to where it joined her body. "Irene," I asked, "can you see now that it's your arm?"

"Why, I guess it must be mine then . . ." She trailed off, confused.

"Okay," I replied. "Now that you see it's yours, can you move it?"

"Well, certainly." She nodded confidently.

"Okay," I said. "Show me."

With that, Irene picked up her left arm with her right good hand and moved it up and down to verify that it worked just fine. The left arm dangled from her right hand like a dead fish on a line.

I knew then, beyond a shadow of a doubt, that Irene had suffered a stroke, caused by a blood clot clogged one of the arteries to her brain. Only a stroke can cause the kind of sudden, disabling loss of motor function on one side of the body that Irene was suffering.

My eye was on the clock. We were now 45 minutes into her stroke and our window of opportunity to treat it was quickly burning away. I imagined her right brain dying from lack of blood, while we conversed about her symptoms. I felt an overwhelming sense of time pressure. If I was going to save Irene, I needed to act fast.

I crouched down so I could talk with her at eye level, pondering how to explain "the problem" in lay terms. "Mrs. Polosky, you have a blood clot causing a stroke of the brain, and I believe it's a life-threatening problem," I said, striving for the right mix of urgency and unflapability.

"The stroke has paralyzed the entire left side of your body," I went on, "and has created a condition known as anosognosia, which keeps you from even recognizing your degree of paralysis." I took a deep breath and then made my pitch. "There is a drug that may be able to break up the clot," I told her. "But the truth is, using it is risky. It might cause a massive brain hemorrhage in the process of trying to help you. This drug, which is called tPA, is generally only given to younger patients who have had a stroke."

I looked down at my patient's open, trusting face. I owed it to her to be completely honest. "Irene," I said, "I'm worried about giving this medicine to you."

Irene looked me straight in the eye. I could see a sense of calm come over her, and at the same time, strangely, a sense of peace entered me as well. For a moment, we simply gazed at each other, breathing in concert.

"Well, Dr. Castaldo, I am grateful that you are here," she finally said. "I know I would rather be dead than paralyzed over half my body." Her deep blue eyes stayed fastened on mine. "I put my faith in you. I know the treatment may be risky, but I am willing to take that chance."

I hesitated a moment, and she leaned closer and motioned for me to put my ear close to her mouth. "Give me the drug," she whispered.

As I straightened back up, trying to process the magnitude of her consent, I again took in the calm, trusting look on Irene's face. I must have been staring because she then gave me a gentle, crooked grin and an exaggerated wink.

"CT's ready," shouted Claranne. "Gotta go, gotta go."

"Gotta go, gotta go," I mumbled thickly. "Had one for my back years ago and everything turned out fine. Just a pulled muscle. Well, see you later," she said, waving goodbye with her good right hand as Claranne rolled her away.

It was now 60 minutes out from her stroke. By
Dilantin keeps them immediately, while Ativan is usually very effective. Using both drugs as a one-two punch is usually very effective. “I’ve got the Ativan,” Joanne announced, biting off the tip of the needle cap and shoving the needle into an IV catheter that was already in Irene’s arm. “We need to call Pharmacy for Dilantin,” she added. Claranne picked up the phone and ordered the Dilantin as we rolled Irene back to the ED.

“Well, so much for tPA,” Claranne said dejectedly. “We all know that seizures mean you can’t give tPA, and the patient is 86 to boot.”

“Now wait a minute,” I said as we rolled Irene down the hallway. “I’m worried about Mrs. Polosky’s age, but I’m not worried about the seizure.”

“You want to give tPA for stroke after she’s had a seizure?” Claranne asked, incredulity clear in her voice.

I understood her concern, but I knew the tPA research literature well. I explained to Claranne that in clinical trials, people who’d suffered seizures were never given tPA because the researchers didn’t want to confuse the data they collected to analyze the drug. It wasn’t that seizures put patients at greater risk for bleeding, but that seizures can mimic stroke. The researchers wanted to be sure that everyone in the study had truly suffered a stroke. Still, I knew I was treading on thin ice. There was no literature at all on giving tPA after a seizure. I reasoned aloud that it didn’t make sense to withhold it once we knew for sure that a large stroke was in progress and that the consequences could be dismal without the drug. I glanced at my watch, recalling once again the time of symptom onset. We still had a little leeway in the three-hour window of efficacy for the drug.

“I am absolutely sure that Irene has had a large stroke and that she might die from it,” I said to Claranne.

“CT’s normal,” called out Joanne. “Just got the call from Radiology.”

Quickly, I went to the computer and called up the digital images to review them myself, slice by slice. Her brain looked normal, but I knew from Irene’s symptoms that it was dying on one side. It was simply too early for a CT to detect the damage.

By tomorrow, I knew that half of Irene’s brain would be black and swollen. I also knew that the swelling would continue to progress, peaking in about 48 hours. By the third day, without treatment, there was a good chance she would die.

“CT has ruled out a brain tumor or hemorrhage,” I said. “The blood tests look good. I have her consent to treat.” I expelled a long breath. “Let’s do the tPA and let’s do it now!” I heard the determination and urgency in my voice. I just hoped my bravado was matched by sound judgment.

There was no one else to speak with. Irene lived alone, and her family hadn’t yet been located. In any case, we had no time to lose. By now, the Dilantin had come up from the pharmacy and the nurses were setting up the tubing to pump the medicine into the vein in Irene’s left arm. Minutes later, the tPA arrived. I saw that Irene was just coming to from her seizure. It was now or never.

Slowly and carefully, I pushed the needle into her IV port and depressed the plunger on a syringe full of tPA. I winced and braced myself for disaster, aware I was courting a risk of death for my patient greater than undergoing open-heart surgery. I pictured the tPA acting like Drano in a pipe or blow a hole in it, causing massive brain hemorrhage and death. I prayed for the former.

But bending over Irene as I watched her vital signs closely, I felt oddly peaceful. I could still hear Irene’s confident whisper in my ear: “Give me the drug.” And I saw again the look in her eyes—a look of serenity that could only spring from faith. I was humbled by the knowledge that Irene’s leap of faith was in me, a total stranger making rapid decisions...
that could transform and save her life—or end it.

This, I knew, was really the essence of medicine—our best guess, based on the available research, our own experience, and what we know about an individual patient. It is no more, no less. Choosing a particular treatment requires faith—sometimes enormous, go-for-broke faith—on the part of doctor and patient alike.

We moved Irene to the intensive care unit, where I ordered an ultrasound of the arteries in her brain. The test, called transcranial Doppler, can often detect immediately how successfully tPA is opening a clogged blood vessel in the brain.

I continued to watch Irene closely. She appeared groggy and tired, but no better or worse than when I had first seen her. When the Doppler machine arrived, I took over the controls. I wanted to see the results myself. Then a fairly new test, the Doppler shoots a focused, low-frequency wave of ultrasound through the skull and into the blocked artery, allowing the doctor to determine on the spot whether treatment is making a difference. Within moments, I located the problem artery on the computer screen. I could see that the vessel had become unblocked and that blood, and thus oxygen, were already flowing back into Irene’s damaged right brain.

The tPA was working!

The night went well for Irene. She tolerated the drug and the fluids we were giving her, and when I saw her the next morning she appeared much stronger. She could even lift her left arm and leg off the bed. But she no longer recognized me and appeared agitated and disoriented.

A follow-up CT scan confirmed that Irene had indeed suffered a massive stroke-in-the-making. Her right brain was still somewhat swollen, but within the areas of dead tissue were islands of normal, living tissue. Much of her brain had been saved by the reflow of blood. The miraculous but dangerous tPA had done its job!

By day four, the swelling had gone down and Irene’s mental sharpness was much improved. But when I saw her on rounds that morning, she looked at me accusingly. “I thought you said the drug you gave me was going to make me all better,” she said.

“But it’s not so!” Her voice was tight with disappointment. By now, she had some feeling and function back on her left side, but her left arm and leg remained weak and she couldn’t yet walk without assistance. “I can’t function this way!” she told me angrily.

“I know, Irene,” I said sympathetically. “It’s too soon to judge how complete your recovery will be.”

As she looked back at me, at once outraged and vulnerable, I felt myself sink into self-doubt. Irene had been in the hospital for almost a week. She was old. She hadn’t been given the drug till almost 100 minutes out from her symptoms. Maybe I should have moved faster. Mentally, I reviewed the research literature on tPA. I knew that people who received the drug less than two hours after their first stroke symptoms had an excellent chance of recovery. Full recovery, however, is measured not in hours or days but in months—three months, in fact. Still, many patients never recover, even with tPA.

Then I heard myself say something that was utterly at odds with the pessimistic ruminations in my mind. I don’t know where the words came from; it was almost as if some other person, or force, was speaking through my lips. “Mark my words, Irene,” I said, my voice strong and confident. “You will get much, much better in time. I predict that within three months, you will do the polka with me in my office.”

She looked at me silently. What was she thinking? That maybe I was right? That I was full of it? That I’d misled her and she’d never trust me again? From her inscrutable expression, there was no way to tell.

That afternoon, Irene was taken by ambulance to a nearby rehabilitation hospital to convalesce. Weeks went by and I busied myself with other patients. I hadn’t heard from her for almost a month when I noticed that she was on my schedule for an office visit. I had no idea how she was doing, though I thought of her often with a mixture of affection and concern.

When Irene showed up for her appointment, it was all I could do not to drop my jaw. Since it normally takes about three months to recover fully from a stroke, I had fully expected her to arrive in a wheelchair, or at least supported by a walker. Instead, she sauntered in on her own two feet, a cane dangling from her right arm. She walked right up and gave me a kiss on the cheek, then reached her arms around me for a long, warm hug.

“How are you?” I asked with a broad smile.

“Thanks to you,” she said. “I brought you some freshly baked oatmeal raisin cookies, and I want you to promise me you’ll eat them.” Beaming, she fished a brown bag out of her purse and handed it to me.

How did she know they were my favorite? Thanking her, I put the bag on my desk and took a good look at her. Irene’s face was radiant and no longer drooping at all. “So tell me, Mrs. Polosky, how are you?” I asked with a broad smile.

“I’m just wonderful, Dr. Castaldo,” she chirped, “thanks to you.”

Then, before I could stop her, Irene put down her cane and purse, stretched her hands toward the

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continued on page 57

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ceiling, fingers dancing, and executed a full pirouette on her tiptoes. “Just look how fine I am!” she exclaimed, clearly proud of herself.

Her exam was completely normal. Search though I did, I could find no hint of weakness or visual loss. Irene was in excellent shape for her age—her limbs strong, her speech distinct, her mind sharp.

“Come with me,” I said, taking her hand. “I want everyone in the office to see you!” With that, I grabbed her two hands in mine and took her out into the reception area, where I led her in a spirited polka, loudly humming “Roll out the Barrel.” Laughing in delight, Irene danced slowly but gracefully, never missing a step. As we sashayed cheek to cheek up and down the hall, I saw my colleagues peer out from exam-room doors, looking both amused and confused. But I didn’t care what they thought. My heart was bursting. My patient was well and whole, and she and I were dancing on air.

It is common these days to talk about the importance of the “doctor-patient relationship.” Usually, this relationship centers on the effort of both physician and patient to communicate clearly and honestly. But once in a while, in the course of working together, something more transpires between a doctor and a patient—something deeper, approaching communion.

We didn’t know it at the time, but Irene and I offered each other the gift of faith when both of us needed it most. Her calm confidence in me during her life-threatening crisis gave me the courage I needed to proceed with an extremely high-risk treatment. I, in turn, offered Irene my own deep faith that she would recover fully, at a time when she was sunk in doubt and discouragement.

In medicine and healing, where does the role of technology end and the role of the spirit begin? What I know comes only from my own experience and convictions. As I treated Irene and came to know her, we offered each other the kind of faith that creates an upward spiral of strength and health. Recovery often depends on medicine or surgery, no question. But healing, I believe, also comes from deep wellsprings of hope, trust, and optimism. When the spirit dances, the body yearns to follow.

Loren

Shortly after his wife Renetta’s death, Loren began searching for the perfect way to honor her memory. It was at this time that, in what he calls “a wonderful case of serendipity,” he received a charitable gift annuity brochure in the mail from DHMC’s Office of Gift Planning. “It seemed like a perfect opportunity to memorialize her,” notes the Dartmouth College alumnus.

By establishing a charitable gift annuity, Loren created a loving memorial to Renetta that will ultimately benefit research at DHMC. He will also receive a generous income tax deduction and a fixed, guaranteed income for life. “Because of my advanced age,” the octogenarian observes, “this is my opportunity for giving with vision.”

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