Life in the Balance

By John Pekkanen

As the soft, early-morning light touched her eyelids, sounds and images swirled through Barbara Gerwitz's mind. Flashing red lights, shrill sirens, loud voices. She realized she was lying on a clammy concrete floor. "Where am I?" Barbara asked.

"Marin County Jail," a woman said. "The drunk tank."

A shiver ran through Barbara. She dimly recalled leaving her home in Petaluma, Calif., at 1:30 a.m. for her job at an all-night San Francisco supermarket. She remembered driving along Highway 101. Then something happened. *But what?*

A duty officer informed her she'd been arrested on four charges: evading arrest, resisting arrest and driving under the influence of alcohol and of drugs.

Her hands shaking, Barbara telephoned her husband, a payroll supervisor for the San Francisco Municipal Railway. "Jim," she said in a quavering voice, "something really bad has happened to me."

Later, in court, Barbara saw the police report. Dated April 10, 1989, it stated that her blue Honda had been weaving across the southbound lanes of Highway 101 at 1:55 a.m.

"You've had the bad luck to be born with two major cerebral problems," the doctor told Barbara Gerwitz

At one point, she'd swerved across a bus-stop area, sped past a stop sign and re-entered the highway on an entrance ramp. The police chased her at high speed for 12 miles and stopped her at the tollgates before the southern end of the Golden Gate Bridge.

The report continued: "The subject stared straight ahead and did not blink or acknowledge my questions and mumbled incoherently." The arresting officer had concluded she was under the influence of alcohol or a hallucinogen.

"Life's a Risk." The "something bad" Barbara alluded to had started seven years earlier, in 1982, when she heard a *swooshing* noise, like water pulsating through a hose, in her right ear. *Must be my heart pounding after climbing the stairs,* she thought. As she lay in bed that night, the sound was louder. She put her hand on her ear and could feel a throb.

Over the next two weeks, medical tests showed a lemon-size abnormality in her brain, just above and behind her right ear. An angiogram, which uses special dyes and X rays to show the brain's blood vessels, revealed an arteriovenous malformation, or AVM. This is a tangled knot of abnormal blood vessels that forms in the brain during embryonic development. The arteries in an AVM are thin and fragile, the capillaries that normally link arteries and veins are missing, and blood gushes through under extremely high pressure. The gushing blood caused the noise Barbara heard.

The neurologist also found an abnormality in her right carotid artery, one of the major arteries carrying blood to the brain. Instead of branching into two major vessels, the artery came to an abrupt stop, and only very small vessels emerged from it, delivering minimal blood.

The doctor was far more concerned about the AVM. It could burst at any time and cause a brain hemorrhage, he told Barbara. It was located deep in her brain, in a critical area that controls movement and sight, making surgical removal too risky, in his opinion. "You'll just have to learn to live with this," he concluded.

From early childhood, Barbara had always coped with any problem or challenge. Now, at age 35, she promised herself: "This thing is *not* going to get to me. I won't let it ruin my life."

Besides the relentless *swooshing* and throbbing in her ear, Barbara suffered increasingly severe headaches. She also had periodic "spacey" episodes, as if she'd suddenly lapsed into a daydream. They struck at any time, even in mid-conversation, and usually lasted only a few seconds. They left her feeling lightheaded.

Her doctors diagnosed "absence seizures" triggered by the AVM and prescribed medication. But it didn't help. The episodes continued.

In 1984, a friend introduced Barbara to Jim Gerwitz. The two hit it off immediately. As they drew closer, Barbara worried how Jim would react to her medical condi-

tion. One day, nervously, she told him about her AVM and the fear that she could die at any moment.

"This doesn't change my feelings for you," he said. "Life's a risk. No one can predict the future."

Later married, they hoped for a child. The doctor said Barbara could have a baby only by Caesarean section. He thought the strain of natural childbirth could rupture her AVM. Twice she became pregnant, and twice she miscarried.

A third time her pregnancy went forward; even her seizures stopped. On April 1, 1987, Travis James Gerwitz, seven pounds, 14 ounces, was born.

"Things are going so well for me that I hardly believe it," she told a friend. "I have a nice home, a wonderful husband, a child. I never thought I'd have any of it."

Double Jeopardy. Then, in the early-morning hours of April 10, 1989, Barbara was arrested and spent the night in the Marin County Jail. In court, urinalysis results proved she had no alcohol or drugs in her system. Instead, medical evidence presented showed that while driving she had suffered an unusually long and powerful absence seizure. Hence her bizarre behavior. The charges against her were dropped.

Two weeks later, on a quiet Saturday afternoon, Barbara suffered a grand-mal seizure–the most devastating type of convulsion. Her arms and legs flailed violently, her eyes rolled back in her head, and she lost consciousness.

Strong doses of medication helped her recover, but doctors told her, "There's nothing we can do except treat your symptoms."

Barbara was on a medical roller-coaster. Every 40 days or so she suffered seizures of varying types and duration. Her life grew more restricted. Her medication was causing constant grogginess, and she had to cut down her hours at her supermarket job.

In the fall of 1990, Barbara saw a newspaper clipping about Dr. Gary Steinberg, a neurosurgeon who was using a new technique to remove "time bombs" in the brain. Immediately, she called Steinberg at the Stanford University Medical Center in Palo Alto. After asking to see her medical records, Steinberg called back. "I think I can help you," he said.

Jim and Barbara drove to Stanford and met Steinberg. A wiry, intense man of 38, he spoke with a quiet confidence that instantly put them at ease.

He told Barbara that in addition to the AVM on the right side of her brain, she also had a condition called *moyamoya*—Japanese for "misty." The name derives from the tiny vessels leading from the damaged carotid artery, which, when enlarged, appear cloudlike on brain X rays.

"You've had the bad luck to be born with two major cerebral problems," Steinberg said. Her worsening seizures, the physician continued, were probably caused by a combination of the AVM and *moyamoya*.

Both had the capacity to irritate surrounding brain cells.

"What's going to happen to me?" Barbara asked.

AVMs bleed, Steinberg explained, and the bleeding can be moderate or catastrophic; *moyamoya* put her in danger of a stroke. "Your risk will most likely increase," the surgeon continued, "because *moyamoya* can be a relentless, progressive disease."

Iron Determination. Ten years before, Barbara's doctor had considered her AVM impossible to remove. Now, Steinberg's team was using refined surgical techniques for AVM removal. The doctor also mentioned a separate new procedure for correcting her *moyamoya*.

"These are both major operations," Steinberg emphasized. "It will be a long, hard pull. Let me know what you decide."

Barbara didn't hesitate. "I have to do it," she told Jim. "This thing could kill me tomorrow."

The AVM surgery was scheduled for February 6, 1991. But on January 27, while getting ready for a Super Bowl party, Barbara suffered a major hemorrhagic stroke. Her entire left side was paralyzed.

Family and friends poured through her room at Stanford University Medical Center or called to pray with her on the phone. Jim quietly reassured her. "If you don't get better, I'll still be here for you."

With iron determination, Barbara plunged into rehabilitation. By the end of February, she'd graduated from a wheelchair to a walker. Dr. Steinberg rescheduled the AVM surgery for March 7.

Before removing the AVM, Steinberg and his team had to shrink it to lessen the risks of catastrophic bleeding during surgery. To do this, they used a micro-catheter threaded through Barbara's femoral artery to identify the major conduits that fed blood to the AVM. Then, holding the catheter's trigger device steady, one of Steinberg's colleagues squirted a small amount of bucrylate, similar to household super-glue, into each one to close it. The procedure took four hours.

A week later, on March 14, Steinberg's surgical team reassembled to tackle the hundred or so smaller vessels that also pumped blood into the AVM but were inaccessible to a catheter. Exposing a small area of Barbara's brain near her right ear, Steinberg gained access to the now-shrunken malformation. Peering through an operating microscope and using tiny instruments, he cautiously cut around the AVM. As he did so, he coagulated the small vessels shut and then clipped and cut off the larger ones he'd glued shut earlier. Five hours after he'd begun, Steinberg cut off the last vessel that pumped blood into the AVM. After he removed it, he stepped back—totally spent.

Later, after the pain of the surgery eased, Barbara realized that for the first time in nine years, she no longer had the *swooshing* and throbbing in her head. By mid-April, she returned home and plunged into re-

habilitation therapy. At the end of May, she had regained enough strength in her left leg to trade the walker for a cane.

The Last Hurdle. On June 19, driving to Stanford for the second surgery, Jim and Barbara dropped Travis off at his school. Before leaving him, Barbara gave her son a big, long hug. "Mommy will be back for good soon," she said.

The next morning, the second major surgery got under way. The challenge was to bring more blood to the right side of Barbara's brain to eliminate the danger of more strokes and seizures. Because there were only five recorded cases of this novel procedure in the United States, and because Dr. Steinberg had never performed it, he had asked Dr. Harry S. Goldsmith, of Boston University School of Medicine, to assist. Goldsmith was a leading authority on omental transposition, a procedure crucial to the surgery.

In the operating room Steinberg opened Barbara's skull. At the same time, Goldsmith surgically exposed her omentum, a large apron of fatty tissue that hangs off the stomach wall. The omentum is rich in blood vessels and promotes new blood-vessel growth when abdominal vessels are damaged. The plan was to connect Barbara's omentum to the right hemisphere of her brain, where it would provide the needed blood.

Goldsmith partially cut away a strip of omental tissue about four inches wide and over two feet long, leaving one end attached to the stomach.

Then Goldsmith made a series of cuts in the skin of Barbara's chest wall. He reached under the skin, and slowly began to pull the graft upward. Near the neck, Goldsmith maneuvered the strip around the back of the right ear. Using incisions in the skin of the neck, he further tunneled the graft under Barbara's skull. Steinberg then pulled the omentum tissue through the skull opening he'd made and gently positioned it over the entire surface of the right hemisphere.

To hold the graft in place, Steinberg stitched it to the dura, the membrane surrounding the brain. He then closed the skull opening. The grafting had taken more than four hours.

Jim had been anxiously awaiting news. Finally Dr. Steinberg relayed what he'd been hoping to hear: "It went very well. She's going to be fine." Jim let out a long sigh of relief, and offered a silent prayer. *It's finally over,* he thought.

Barbara went home a week later. Her seizures diminished and, early this year, abruptly stopped. With further therapy, by spring she needed only her cane to walk outside. Her memory returned with new clarity.

On a recent afternoon during a stroll, Travis turned to his mother. "You're a regular mom now, aren't you?" he asked, eyes sparkling.

"Yes, honey," Barbara said, with emotion. "I'm a regular mom, and I'm home to stay."

Quip Lash

One Sunday, I was called to substitute for our church organist. Being a bit unsure of myself, I left early for church to practice. As I walked down to the car, my husband stuck his head out the door and yelled, "Break allegro!"

—Contributed by Edith M. Whyte

After my brother and I left home and were on our own, my parents got a mixed-breed dachshund/beagle that they named Stretch. On a visit, I was riding with my mother, sitting on the passenger side of her car. I noticed numerous smudges on the lower half of all the side windows and asked her about them. "We call those Stretch marks," she said.

—Contributed by Jeffrey L. Wilt

Following their doctor's advice, my parents were using more poultry in their meals. On a visit to their house for a spaghetti dinner, my children noticed that the meatballs were a slightly different color. "Grandma," my son asked, "are these your meatballs?"

"Yes, dear, they are," she said. "Grandma is now serving only fowl balls."

—Contributed by Gisela Wolk

At the gas station I frequent, I was perturbed to see that the old air machine had been replaced by one costing a quarter. I complained to the attendant that we now were being charged for something that had been free for years. "It's not my fault," he said. "It's inflation."

—Contributed by Alan Ball