

tests to rule out conditions like Parkinson's or multiple sclerosis or some undetected brain trauma. The good news, the doctor said, was that Wiedemann had none of the above. The not-so-good news was that he had a condition called essential tremor. And it would probably get worse.

**Essential tremor is the most common of all movement disorders, affecting around 10 million people in the United States. Former president Bill Clinton and retired Supreme Court Justice Sandra Day O'Connor have it. So did the late Katharine Hepburn.** Yet somehow essential tremor tends to get overlooked in terms of public awareness and funding for research. Many medical professionals consider it a "syndrome"—a collection of overlapping symptoms—rather than a full-fledged disease. Some even call it "benign tremor"—but there's nothing benign about its impact on a person's daily life. Essential tremor can turn the most basic tasks into steep and jagged mountains to climb. **Though it's most common and typically most severe in older people, it strikes young people and those in middle age as well. It can derail careers and make people embarrassed, isolated, and depressed.** For a competitive swimmer like Karl Wiedemann, it threatened to steal the life he loved. "Something had to be done," he said, "so I went looking for answers."<sup>10</sup>

For a while Karl kept his shaking at bay with a prescription drug called primidone, an anti-seizure medication that wouldn't interfere with his intensive swim training. But then the primidone reacted with another medication and had to be discontinued. The tremor got worse. Simple activities Karl once took for granted—buttoning his shirt, tying his shoelaces—became daily frustrations. A bowl of soup was a nonstarter. When deep brain stimulation came on the scene, Karl checked it out. When he found out about the drilling, he said thanks, but no thanks—he'd hold out for something less invasive. Then came the sad day when Karl quit competitive swimming; he worried that he'd fall from the starting blocks before the race began. His future looked bleak.

After focused ultrasound gained FDA approval for treating essential tremor, in 2016, Karl connected with Dr. Travis Tierney, a neurosurgeon

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10 Wiedemann, "Back on the Blocks: 'Focused Ultrasound Gave Me Back My Life.'"

then working at the Sperling Medical Group in Delray Beach, Florida. **(It's one of three dozen U.S. medical centers—including the Mayo Clinic, Stanford, and Penn Medicine—that collaborate with Insightec in delivering this extraordinary innovation.)** Like Kimberly, Karl underwent a series of MRI-guided sound wave zaps to burn away a small part of his thalamus. "It's a very delicate dance the surgeon is doing," he said. "He's going after a spot in your brain that's about the size of a pea—without having to physically go into your skull."<sup>11</sup> After each sonication, Karl was asked to trace a spiral on a pad of paper. Over the course of three hours, his drawing improved from irregular spikes to a smooth, flowing curve. **Within seconds after the treatment concluded, he was able to legibly write his name for the first time in fifteen years.**

Today Karl is back in the pool, training all out to set new world records for the breaststroke in the 80-to-84 age group. He can button his shirt without a second thought, pour a glass of wine without spilling a drop. Friends who witnessed his old struggles are astounded. **If you didn't know he had essential tremor—well, you'd have no way of knowing. Focused ultrasound, he says, "gave me back my life."**

Karl's case is dramatic but not exceptional. According to Dr. Desai, more than 5,000 Parkinson's and essential tremor patients around the world have found significant relief with Insightec's ultrasound therapy.

Clinical trial data shows that the average patient's tremor had improved by 69 percent one year after the procedure, 75 percent after two years, and 76 percent after three years. As Dr. Desai explains it, "These people get better over time. Their brain starts firing again, the way it used to—there's neuroplasticity. People are getting better because they're back in action." The latest numbers show durable improvements for at least five years out.

Under the protocol approved by the FDA, patients are treated on the side of the brain that controls their dominant hand—the left side for right-handers, for example. An Insightec study is underway to treat the other side as well, after allowing at least nine months for the brain to heal. Early

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11 INSIGHTEC, "Karl Wiedemann Is Living Life to the Fullest."