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## Up Close: A life-saving light

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## UP CLOSE

### A life-saving light

Deal's invention, which uses ultraviolet light to disinfect hospitals, has saved thousands.

**D**r. Jeffrey Deal '77 has had his share of watershed moments.

"The first time I saw Dinka patients in South Sudan sleeping on clean sheets and getting IV therapy was one of those moments," said Deal, a retired ENT who is involved in humanitarian medical work around the world. "The first time my cochlear implant patients talked to me was a great moment."

But one particular moment in an Ebola hospital is hard to top.

The year was 2014, and the epidemic in Western Africa that would claim more than 10,000 lives had gripped the world. The Liberian government had made a very specific request: They wanted a doctor with a unique skill set that included experience with tropical diseases and knowledge of Tru-D SmartUVC, disinfecting units that had been donated to the country to help in its fight against Ebola.

Deal had spent months in

other African countries. He had training in tropical medicine. And he knew how to use Tru-D. He was, after all, its inventor.

Years earlier, in his Charleston, SC, garage, Deal had begun work on the machine, which uses ultraviolet light to disinfect spaces in a way chemical cleaning can't.

Tru-D (the "D" refers to disinfection) met every need in that Liberian hospital that day: its waves were contained by the makeshift sheeting walls; its remote control could be immersed to be sanitized; its power supply was universal; it killed the Ebola virus.

"It was like it was designed for that moment," Deal said. He felt like Jeff Deal of 2014 had consulted with Jeff Deal a decade earlier, telling him every feature that would be needed in the future.

"I had this one moment of insight... a flash from God," he said. "And that flash, it felt like it was for that very moment."

Deal first came to Furman on a basketball scholarship,

transferring in as a junior. At the end of that academic year, he decided he wanted to be a pre-med student. The program advisor wasn't sure he could handle the sciences. But Deal looked up some of the classes and talked to the professors. They told him he could do it—if he was willing to work.

"That career path took off because some Furman professors took an interest in encouraging me," he said. "I have a tremendous debt to them."

He met his wife, Hart Hamrick '75, at school, and they married in 1976. After medical school and service in the US Navy, Deal launched a private practice, Charleston ENT, in 1989.

In the '90s, he began using his medical skills on mission trips around the world, eventually spending much of each summer in South Sudan. One of his Charleston patients gave money to build a hospital there.

Then Deal was diagnosed with retinal disease in 2006 and a specialist told him he needed surgery immediately. But Deal put it off a few weeks—he needed to be in Sudan where hospital construction was underway.

He delayed too long. In a year of "bone-jarring changes," Deal lost his vision to the extent that he could no longer perform surgery and had to retire from his practice.

"The wonderful thing is, that freed me up," he said.

He studied tropical medicine at the University of London and earned a master's degree in anthropology. And he kept working on a problem that had been bothering him for years: the tens of thousands of people in the United States who become ill or die each year from hospital-acquired infections.

"That's got to be a solvable problem," he said.

Deal envisioned a machine that would use non-ionizing

radiation to disinfect rooms. His brother David helped him identify UVC as the most germicidal wavelength. The first remote for his device was a modified garage door opener. Early experiments were conducted using spore samples acquired from microbiologist friends at local labs.

"Pretty quickly we realized, 'Holy cow, this really works,'" Deal said.

He hired an engineering team to build a prototype, then spent years showing hospitals first that the device worked and, second, that they needed it. Ultimately, a Tennessee company agreed to market the machine. It was so successful so quickly that it soon spun off into an independent company.

Tru-D Smart UVC now encompasses both the device and the company that markets it. Deal isn't involved there.

"I like being the mad scientist, but the business and sales part just doesn't interest me," he said.

Still, he's emotionally attached, specifically forbidding any R2-D2 references in the machine's presence. (The machine's cylinder like shape does bear a remarkable resemblance to the Star Wars robot though.)

Tru-D can speak multiple languages and warns users when it is about to activate so they can leave the room. The machine doesn't shut off until sensors measure the light reflected back from the darkest corners at a germicidal level.

"Antibacterial resistance has nothing to do with it because we're physically damaging the DNA," Deal said.

Duke University recently received a grant to study Tru-D. It found that adding the device to the disinfecting process reduced hospital infection rates by 30 percent.

"The machine's saved thousands of lives already," Deal said. ●

— by Kelley Bruss