

## InstaTrak Helps Doctors Operate In Confined Spaces

Boston University/Brigham and Women's Hospital



Boston University and Brigham and Women's Hospital deliver an electromagnetic, three-dimensional surgery system that provides real-time images to surgeons performing sensitive surgical procedures.

Fresh out of Boston University Medical school in 1991, Maurice Ferre, M.D., could have gone the usual path and headed off for a residency. But Ferre, who 15 years later is a businessman with a medical degree, chose instead to accept a fellowship at the university's Health Care Entrepreneurship Program, under the direction of Richard Egdaahl, M.D., and John Valentine.

"It was a unique model," says Ferre. "It was an entrepreneurial residency, and it fit in perfectly with what I wanted to do. While in medical school, I also took a lot of business courses and got a double degree in public health."

Once at the center, Ferre began working with Frenenc Jolesz, M.D., and Ron Kininis, M.D., of Brigham and Women's Hospital, on a project that led to the commercially successful InstaTrak® system, an electromagnetic, image-guided

surgical technology.

InstaTrak® also resulted in the creation in 1993 of Visualization Technology Inc. through Boston University's Health Policy Institute. It refined the system and focused the technology initially on ear, nose and throat surgeries. VTI estimates that it holds 80 percent share in that market. "Because of my training, I can communicate well with the medical community," he says. "That has been a big advantage for me."

### **System Shows Three-Dimensional View**

Ferre says the InstaTrak® system provides a three-dimensional view of a patient's CT scan combined with real-time information about the location of surgical instruments during operations. "Essentially, what we did was bring a military technology — one used for helping pilots guide missiles while flying F-16s — into the operating room," says Ferre, who was the company's founding CEO.

"We were able to build on that technology to track tumors and work in very confined spaces," he says. "Another way of putting it is that we were the first company to bring electromagnetic GPS tracking technology to the operating room. We used CT scans and MRIs as road maps," he says. "We used a tracing technology to track surgical instruments in relationship to tumors and important structures like the optic nerve. It was the perfect marriage."

VTI has since expanded to cranial, spinal and orthopedic procedures and today is used in more than 800 surgical centers in the United States and abroad. The company was sold in 2002 to General Electric, the world's largest imaging company, for more than \$50 million.

### **Technology Doesn't Require Line of Sight**

Ferre says most image-guided surgery systems available today are based on optical tracking, which uses an infrared camera and LED array that facilitate the communication between the camera and the surgical instrument.

“VTI’s technology is electromagnetic so it requires no line of sight between the instrument and the cameras. With an optical system, someone in a crowded operating room could block that path and interrupt the ability to track the instrument. But with VTI’s system, the transmitter and receiver can see each other even without an optical line of sight.”

Ferre praises Egdahl and Valentine for serving as mentors while InstaTrak® and VTI got off the ground. Valentine served as a director of the company until its sale. "They set up an incubator at Boston University that was geared toward people like myself," he says. "So I was able to explore business opportunities in the medical world. They nurtured my ideas and I was able to run with one: InstaTrak®."

### **Enter the Angel Investor**

Valentine also introduced Ferre to Tom Rosse, an entrepreneur in the medical device industry who put millions of his own money into VTI when it was in its earliest stages. He also followed up with more financial help. "Tom was an angel

investor who believed in the process,” Ferre says. “I could not have done it without him. Eventually, we built the company to more than 150 employees before we sold it.”

Ferre has since moved back to his native city, Miami, to do it all over again. He now is founding CEO of Mako Surgical Corp. “It’s an orthopedic robotics company,” Ferre says. “We’re trying to take surgical robotics to the next level. In a sense, it’s kind of like what we did with InstaTrak®.” He says the company just closed on a \$20 million round of financing, the largest round for a medical device firm in the state of Florida.

“Maurice is a real entrepreneur and we became very good friends,” says Valentine, who now serves as vice chairman of the board of Boston Medical Center, BU’s affiliated teaching hospital. “He liked the ideas that two doctors had at the Brigham who were working on brain surgery and he got very excited about it.”

Though Ferre understood the technology much better than his mentor, Valentine says Ferre knew little about raising money. To start VTI and get InstaTrak® off the ground, Valentine arranged meetings with financiers, including Tom Rosse, who put in the first \$1 million. Valentine describes Rosse as his own angel network.

“Tom Rosse is an extraordinary guy,” Valentine says. “He believed in this and never blinked when we needed more money. That’s the kind of backer you need.”

### **Taking InstaTrak® to ENT**

Valentine also helped guide Ferre to a market that could support VTI. “At first, the application we were considering focused on the brain,” he says. “But I looked at the number of procedures done and it wasn’t enough.

“As a doctor, Maurice could see a lot of applications,” Valentine says. “But my thinking was that we needed to grind out some salable products.” InstaTrak® was well-suited for ear, nose and throat work, Valentine says, and the next step was to bring in several engineers who began to write the necessary software.

“When you go up the nose, you usually can’t see where you are operating,” he says. “When you’re up there cleaning out debris, you can get awfully close to the optic nerve and the brain.” Because surgeons do not want to damage vital structures, they sometimes had to repeat surgeries, Valentine says. “With InstaTrak®, though, they know exactly where they and their surgical instruments are.

“Our technology has a screen showing the patient’s head and it puts the sharp end of the instrument right in the cross hairs. It reduces the number of times you have to do surgery over and that’s big.”

When GE became interested in buying VTI, it also looked at a dozen other systems, Valentine says. But they were all optical, and InstaTrak® had the advantage of being electromagnetic. “Ours was the best,” he says. “I’ve heard some doctors say that anyone who doesn’t use InstaTrak® should be sued for malpractice, that’s how much many of them like it.”

This story was originally published in 2006.

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