

When Millimeters Make A Difference

“Our goal is simpler, safer surgery using computer technology.”

– Brian Heaney, CEO, InnerOptic Technology, Inc.

The same technology in Nintendo Wii is the central component of InnerOptic Technology’s InVision™ 3D Guidance System, a three-dimensional, visual guidance system that recently received U.S. Food and Drug Administration approval for ablation procedures.



Dr. David Iannitti of Carolinas Medical Center in Charlotte is testing InnerOptic Technology’s InVision 3D Guidance System to ablate liver cancer tumors.

Ablation, where tissue is heated in order to kill diseased cells or tumors, is used to treat several medical conditions including cancer originating in the liver and metastatic cancer that’s spread to the liver from other organs. An ablation antenna or needle is applied directly to tumors in open surgery or inserted through the abdomen releasing radio frequencies that heat and kill cancer cells

within 15 minutes. Ablation prolongs life, especially for patients who are not candidates for or not responding to surgery, chemotherapy, radiation or other treatments.

InnerOptic, a UNC Chapel Hill spin-off, partnered with doctors David Iannitti, chief of Hepato Pancreatic Biliary Surgery in the Department of General Surgery, and John Martinie, Hepatobiliary, Pancreatic and Advanced Laparoscopic Surgeon, both of Carolinas Medical Center in Charlotte. Iannitti and Martinie are internationally recognized specialists in liver ablation surgery who have developed radio frequency and are researching microwave ablation technologies. InVision is important to them because of the benefits of three-dimensional over the two-dimensional ultrasound guidance systems currently in use.

“A lot of people are interested in this because surgeons in general are not the most comfortable with ultrasound,” Iannitti commented. “With the trajectory (provided by

InVision), you stay on a straight line ensuring less blood loss and trauma to the liver.”

Without InVision, Iannitti at 57 percent has one of the highest success rates in the world targeting tumors correctly the first time. With the InVision, his rate jumps to 100 percent. Research studies show that a novice surgeon using InVision can achieve a one-time success rate of 82 percent compared to 24 percent without the system.

“Our goal is simpler, safer surgery using computer technology,” said Brian Heaney, InnerOptic chief executive officer. “Surgeons have great hand-eye coordination and great dexterity, but it’s difficult to perform minimally invasive surgery because they can’t see what they are doing. They have to reconstruct so much in their heads. So why not use a computer that is very good at doing that? We’re taking what is used in games, flight simulators, military applications and other kinds of technologies and bringing it into the operating room.”

“The benefit of having enhanced visualization is to make what we do more accurate,” Martinie said. “The days of using older types of navigation when driving your car or flying a plane are pretty much over. This is another application of that same technology. So when I’m going to destroy a tumor, I’m better doing what I do.”

Martinie and Iannitti agree that the greatest advantage of InVision is the real-time feedback. “The liver and organs move around,” Iannitti said. “When you operate on a liver, how do you use old data, even if it is five minutes old, to guide a needle when millimeters make a difference? You need real-time.”

InVision is also designed for needle guidance for open, percutaneous and laparoscopic biopsies. Martinie predicts pediatrics, premature babies, brain surgery and breast biopsies as future applications. Iannitti and Martinie hope future systems offer touch screen capabilities and robotics. **1**



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