

MEDICAL DEVICES — WINNER

Accuray's CyberKnife: Making inoperable an inoperable word

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Inoperable. There are few more dispiriting words in the English language. But Accuray Inc., our Sunnyvale-based winner in the medical devices category, has developed a device that may one day make that awful term obsolete.

Using Accuray's CyberKnife robotic radiosurgery system, doctors have ablated tumors in more than 25,000 patients over the past four years. Many of those tumors originally had been deemed inoperable.

With the introduction in 2004 of a software-based tracking system called Synchrony, the CyberKnife's use to treat previously inoperable lung cancer tumors with carefully targeted radiation has skyrocketed.

Designed to continuously detect, track, and correct for tumor and patient movement throughout treatment, the CyberKnife targets multiple beams of radiation with sub-millimeter accuracy. Before Synchrony's introduction, the system could only be used on lung cancer patients if they were able to hold their breath repeatedly for 30 to 60 seconds at a time. Using Synchrony, however, patients can breathe normally throughout the surgery while the system tracks the tumor's movement using real-time X-ray imaging.

While Accuray technically has existed since 1992 and the CyberKnife was used to treat its first patient in 1994, the company's survival was not certain until recently, according to founder Dr. John Adler, a Stanford neurosurgeon, who last month published his story, "A Surgeon's Adventure in Silicon Valley," on the Web site Scribed.

With the Food and Drug Administration's clearance in 2001 for the CyberKnife to be used on radiation-susceptible lesions anywhere in the body, the company's production of the roughly \$3 million machines has taken off. Accuray expanded its Sunnyvale facilities earlier this year, doubling its manufacturing capacity. Some components arrive as completed systems from outside contractors, but the linear accelerator built into ev-

ery CyberKnife system is manufactured in the Sunnyvale facility, which also manufactures the final product.

Today, there are 56 CyberKnife installations in the U.S., and a total of 85 worldwide.

Clinical studies have produced unrelentingly positive results and patients themselves have become some of the strongest advocates for doing the fundraising and construction necessary to install more CyberKnife systems throughout the world. Stanford University, in fact, recently became the first medical center with two CyberKnife systems; half a dozen other locations will have two systems within the next few months.

"Our two-year study shows that the CyberKnife system is a highly accurate treatment for patients with tumors anywhere in the body, including static tumors and those that move with respiration," said Pushkar T. Desai, a medi-

cal physicist at St. Anthony's Hospital in Oklahoma City, following the study's release in July. "The sub-millimeter accuracy of the CyberKnife System is especially important for patients with tumors located near critical structures because it is designed to treat the tumor effectively with minimal harm to the surrounding area."

Researchers at the University of Pittsburgh Medical Center found that they could turn up the intensity significantly, zapping cancerous growths more completely than ever before. "Most radiation oncologists can't go past 2 to 3 grays of radiation," says Cihat Ozhasoglu, who headed up the team. "We can deliver 25 grays."

While commercial success certainly is gratifying, Euan Thomson, who succeeded Dr. Adler as Accuray's CEO in early 2002, says the company's employees are motivated by far more than money.

AT A GLANCE

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Founded 1990

John R Adler MD - Board member
Euan S. Thomson PhD - President/CEO

"We have a tag line: 'Our business begins with patients,'" he says. "This is an incredibly rewarding place to work. We're really changing clinical practice. We're starting to see treatments for prostate cancer, liver cancer, even pancreatic cancer, for which there has been very few options."



PRECISE TREATMENT: Accuray CEO Euan Thomson shows off the company's CyberKnife robotic radiosurgery system at a recent tradeshow.