Breast Cancer Detection Technology feature

By Jeff Louderback

After his mother was diagnosed with breast cancer a decade ago, Dr. Steve Rogers was shocked when he discovered the methods radiologists still applied to analyze mammograms.

"They placed film on a light box and used a magnifying glass to discover potentially cancerous areas," Dr. Rogers explained. "I couldn't believe that, in this when cutting-edge technology is developed so fast that one system outdates another in months, cancer detection was still at that stage."

Before serving as a professor at the Air Force Institute of Technology (AFIT), based at Wright-Patterson outside of Dayton, Dr. Rogers spent part of a 20-year career in the Air Force designing smart weapons, which used next-generation PC-based technology to help American fighter pilots detect SCUD missiles in Desert Storm. "Why not use the same technology to enhance the detection of breast cancer," he thought.

When talk about closing AFIT arose in 1997, Dr. Rogers left the college and poured his soul into the development of Second Look. His company, Qualia Computing Inc., sprouted from discussions around the kitchen table of his Beavercreek home - where Rogers and his team of technology-minded associates developed a plan. The fruit of their labor is Second Look - a computer-aided breast cancer detection system designed to help a radiologist more effectively interpret mammograms.

"It's widely known that early detection is crucial in surviving cancer," said Dr. Rogers, who holds a doctorate in electrical engineering and serves as the president of the Beavercreek-based Qualia Computing. "Second Look's advanced pattern recognition and image analysis aid in early detection (of cancerous tissue)."

Qualia's technology, Dr. Rogers says, is cost-effective and simple for medical professionals to operate. A patient's mammogram is loaded into Second Look's automatic feeder, and the film is digitized. The technician issues simple commands via a keyboard and touchscreen. Then Second Look processes the mammogram film and searches for clusters of potential cancerous microcalcifications and masses. Computer printouts of the mammogram identify suspicious areas for the radiologist to review.

"Simply put, the computer-aided detection is like a reliable second opinion," Dr. Rogers said. "The radiologist always makes the final diagnosis."

Double reading, as the industry term is called, is increasingly becoming a more common form of interpreting mammograms, according to Dr. Jeff Hoffmeister, an M.D. in Los Angeles who serves as a consultant to Qualia.

"Studies show that double reading increases the sensitivity (detection) of breast cancer by 5 to 10 percent, and even as much as 15 percent," Dr. Hoffmeister explained. "With one reader, figures indicate that 80 percent (of cancerous tissue) is found.

"Typically, the second reading has been done by an additional radiologist, but that is too expensive for many (medical) facilities," he added. "The alternative approach is computer-assisted diagnosis where computers scan films and point out areas that deserve closer investigation."

Dressed in sandals, khaki shorts and a stylish wolf-emblazoned t-shirt, the relaxed and affable Rogers does not fit the image of a corporate executive

"One time, he was in Montreal meeting with investors, and they invited him to the opera," said a grinning Don Johnson, Qualia's assistant vice president of corporate development. "Men were in tuxes and women wore evening gowns. Steve slipped on a pair of black jeans, a nice t-shirt and a black leather bomber jacket. That is formal attire to him."

Investors and hospital representatives, clad in designer suits and shiny leather shoes, have overlooked Rogers' casual appearance. They are more interested in Second Look's capabilities. Unlike most start-up companies, Qualia has not struggled to raise capital. Officials from Canada-based BioChem Pharma read articles about Second Look and bought exclusive worldwide distribution rights to the product more than two years ago. The deal included a 25 percent equity interest in Qualia. Rogers says that Qualia receives royalties on the sales. To date, BioChem has provided Qualia with $12 million to perfect and test the product.

For three years, clinical trials with Second Look - intended to determine whether the system actually increases the percentage of cancerous tissue detected - have been conducted at renowned institutions nationwide like Johns Hopkins University in Baltimore, Harvard University and the Presbyterian Breast Center in Charlotte. Final results from the trials are not completed, but Qualia has heard "numerous favorable comments." One example includes a patient at Harvard whose cancerous tissue was not seen by the radiologist's initial reading but was found by Second Look.

"If the cancer had not been discovered, it may have been a year or two years before that woman would have returned for another mammogram," Dr. Hoffmeister said. "By that time, the cancer would likely have been more advanced."

Though the U.S. Food and Drug Administration has not approved the sale of Second Look in the United States - Rogers expects that to happen in 2001 - BioChem's subsidiary, CADx Medical Systems, recently started marketing the product in June. To date, 10 systems have been sold.

The market for breast cancer detection technology is mostly untapped, Dr. Rogers says. Qualia's chief competitor, R2 Technologies in California, received FDA approval for a

similar product in 1998. "They have sold about 100 units," Dr. Hoffmeister said. "There's an opportunity for at least 10,000 in the United States alone, so we are confident that Second Look will be in demand."

Physicians, Dr. Hoffmeister admits, are traditionally cautious about embracing new technology. Health care professionals are gradually becoming more intrigued with breast cancer detection systems like Second Look, he says. Dr. Richard e. Bird, a breast imaging expert at Presbyterian Breast Center, agrees.

"There's no question this is a technology that is here to stay," said Dr. Bird, whose facility participated in Second Look's clinical trials. "This is first-generation software, and it will only get better.

"Even if computer-assisted diagnosis increases detection by just five percent, that means the sensitivity rate would increase to 85 percent," he added. "That translates into many lives being saved."

Qualia has since moved from the kitchen table of Dr. Rogers' home to a Beavercreek office. The company has 40 full-time employees, including 12 Ph.D.s. Dr. Rogers promises that Second Look is just the first of many products that will feature Qualia technology. The company is developing six prototypes of products related to the medical field.

"There are several potential applications where computer intelligence can help with health care," said Dr. Rogers, who would not disclose the specific applications of the prototypes. "Our technology will address those areas."

Dr. Rogers' mother still receives treatment. Diagnosed with the disease in 1992, she has beaten the odds. Many women, Rogers explained, do not live longer than five years with breast cancer. Dr. Rogers hopes Second Look will prevent his wife, daughter and women worldwide from suffering from the disease. Pointing to national figures indicating that one out of eight women will get breast cancer, he believes there is a dire need for the technology.

"Our goal has always been to get the highest-quality breast cancer detection system to the most women as soon as possible," Rogers said. "We believe that, as more hospitals use Second Look, many lives will be saved. That, in itself, makes everything we do worthwhile."

###