

Imaging Breakthrough "Sees" Lung Disease

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An Israeli startup has developed a high-tech stethoscope that draws a picture by gauging lung vibrations. Its sales prospects are not just hot air
by Neal Sandler

Igal Kushnir has long been convinced that breathing has a lot to tell us about what's going on inside our bodies. Indeed, says the 61-year-old Israeli pediatrician, that's why nearly 200 years after it was invented doctors still use the stethoscope to make diagnoses by listening to airflow in the lungs.

The problem is, doctors often disagree about what they hear through a stethoscope—and in many cases arrive at totally different conclusions. To fix that problem, Kushnir has spent the past decade developing a high-tech solution that uses the same principle as a stethoscope, but gives doctors a more accurate and informative image of lung function.

The years of research finally have paid off. Kushnir has developed a new technology called Vibration Response Imaging (VRI) that measures energy generated in the lungs and analyzes it to diagnose conditions such as asthma, pneumonia, and lung tumors. On July 23, the U.S. Food and Drug Administration granted Kushnir's Israeli startup company, Deep Breeze Ltd., approval to begin marketing a VRI device in the U.S. This comes on the heels of earlier approvals in Israel, the European Union, and South Korea.

Good Vibrations

Deep Breeze is the latest in a line of Israeli medical device companies whose breakthroughs have made them global success stories. Some, such as Itamar Medical (ITMR.TA), Syneron Medical (ELOS), and Given Imaging (GIVN) have gone public in Israel or on the Nasdaq, while other have been snapped up by the likes of Johnson & Johnson (JNJ), Medtronic (MDT), and Boston Scientific (BSX). Israeli banking sources say that foreign investment banks and global medical technology giants already are in hot pursuit of Deep Breeze, looking to take the company public or possibly cut a strategic deal.

Kushnir's process, which uses no radiation, works by analyzing acoustic vibrations given off by the lungs. As a patient breathes normally for several seconds, sensors placed on the back—in effect, electronic stethoscopes—pick up these lung vibrations and feed them to a computer, where they're processed and turned into vivid images. Conditions such as asthma, emphysema, and pneumonia each produce distinct and definable images.

"In a matter of mere seconds, a doctor using the technology can ascertain an enormous amount of information about the lung that would ordinarily take hours and require the use of several devices," says Kushnir. He serves as the chief executive officer of Deep Breeze, which is based in Or-Akiva, between Tel Aviv and Haifa. Another advantage of VRI, Kushnir says, is that it could substantially reduce demand for X-rays. (Kushnir has long criticized overuse of radiation among doctors.)

Big Sales for Big Ticket Item

Physicians on both sides of the Atlantic who have tested the new technology are impressed. "VRI is an extremely novel approach that literally allows the doctor to see an image of what he is hearing," says Heinrich Becker, a leading German pulmonary expert at the University of Heidelberg. Deep Breeze began selling in several Western European and East Asian countries earlier this year.

The company plans to launch U.S. sales by the end of 2007. At first, use of the Deep Breeze system—with an average price tag of \$40,000 to \$50,000—likely will be limited to pulmonary clinics and intensive care units. Even so, the company could log hundreds of millions of dollars in annual sales in the U.S. market alone.

"Their device could largely replace existing breathing tests, as there is nothing else like it on the market," predicts Atul Mehta, vice-chairman of pulmonary and allergy medicine at the Cleveland Clinic, who has been testing the technology for the past year. Mehta thinks every hospital and clinic in the U.S. with a pulmonary unit eventually will need at least one VRI system.

Developing Cheaper Models

Deep Breeze aims to expand into the wider market. The company already is at work on versions of its device that could cost as little as \$10,000. "It's so easy to use that we're looking to develop much cheaper models that will go into general practitioners' offices," says Avraham Ludomirski, managing partner at SCP Vitalife Partners, a U.S.-Israeli venture capital fund that is among the major investors in Deep Breeze.

Now that he has mastered VRI, Kushnir also is looking for applications beyond lungs. He's already testing a second

device that uses VRI technology to analyze heart function, though the company is tight-lipped about how such a system would actually be used.

Changing History

Founded in 2001, Deep Breeze has raised \$30 million from local and foreign venture capital funds. "We'll have to decide in the next few months on how to raise additional funds to finance our planned rapid expansion," says SCP Vitalife's Ludomirksi, who also serves as the chairman of Deep Breeze. Options under consideration include: an initial public offering on Nasdaq; another round of financing from private investors; or a strategic alliance with a leading medical device company.

In the meantime, Deep Breeze is rapidly expanding its marketing force in order to gain wide acceptance of the new technology. If the company succeeds as hoped, someday even the trusty old stethoscope could be consigned to the storeroom of history.

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