

## HEALTH

### Israeli medicine's magic wand

Physicians have for millennia dreamed of having a magic wand that could be passed over patients' bodies to discover what, if anything, is wrong with them. Witch doctors, sorcerers, "energy healers" and others with unproven powers have made such claims. The advent of computerized tomography and magnetic resonance imaging has brought the goal of non-invasive diagnostics closer, but even these expensive technologies won't pick up every abnormality, and can't be used for routine screening.

Could a patented device costing between \$7,000 and \$15,000, invented by Dr. Alex Kanevsky (a former Russian immigrant Israeli physician) be that magic wand? One can be forgiven a natural skepticism, as even doctors who have used it in controlled clinical trials are unable to explain how it works.

Called Medex Test, the device is painless, non-invasive and radiation free. Patients lie fully clothed while a small electrode "pen" is attached to a finger and another to a toe. After an initial reading of the "electrical impedance" of the body's "dermal-visceral zones," a harmless electric current is passed, and another reading is made. The "pen" is connected to the monitor of a regular computer, and within minutes the doctor is shown graphic data on blood circulation, respiratory system, immune system, airways, the spine and more.

According to the company, Medex Screen Ltd. of Arad, a computer program processes the data, indicating via a graphic display not only which of 15 body systems are not functioning properly, but also whether it is only temporary or a functional and pathological disorder of the internal organs, even at an early stage.

The Medex Test, says company founder and CEO Moshe Golan, "effectively integrates principles of neuroreflexology and pathophysiology in a device that is simple to operate and provides accurate results within 20 minutes. It has been shown to screen the cardiovascular, gastroenterological, hepatic, immune, respiratory, endocrine, genitourinary and spinal cord systems with an average accuracy of more than 80 percent."

Approved by Israel's Health Ministry as being safe (but not as being effective, which the ministry does not claim to concern itself with), it can be used on children as young as six,

and even on pregnant women.

Voodoo? Hocus Pocus? Not according to Dr. Eyal Zimlichman, an internal medicine specialist at Sheba Medical Center who headed a team that used the device on 250 patients in Tel Hashomer's internal medicine department. He published the team's findings in the October 2005 edition of the *Israel Medical Association Journal (IMAJ)*.

Prof. Yehuda Shoenfeld, a leading Israeli internal medicine expert at Sheba who edits both IMAJ and the IMA's Hebrew-language medical journal, *Harefuah*, was so impressed by the device that last May he organized a scientific conference on it at Kfar Hamaccabiah attended by 100 physicians, and agreed to be a member of the company's local advisory board. Shoenfeld asked Zimlichman, his colleague, to test it objectively on Sheba patients.

"I approached it very skeptically. I don't have any connection to Medex Screen Ltd., and went about the clinical study as if to prove it didn't work. We tried very hard, did the study properly, and found that the results were quite amazing. The main problem for doctors trained on the principles of evidence-based medicine is that we don't know how it works. The inventor says it's based on the principles of reflexology and meridians in the body," Zimlichman told *The Jerusalem Post*.

In the four-page IMAJ article, Zimlichman and his team said the device "has the potential to serve as a screening tool for inner-organ pathologies. Further research should be conducted to create more evidence to support or dispute the use of this technique."

But in his interview, Zimlichman was more enthusiastic. "While we want to do more research on how the Medex Test should be used, we think without doubt that it could effectively be used for screening asymptomatic people or patients with an unspecific complaint, and to assess the efficacy of medical treatment. The device has a potential to go far if the results stand up in large-scale studies. I suggest clinical studies in primary care, at the family doctor level."

The device, he adds, has been most accurate in picking up cardiovascular, respiratory, spinal, immune, endocrine, genitourinary and gastrointestinal disorders, but not brain diseases, apparently because the brain produces its own electrical signals, that confuse Medex.

AN ideal diagnostic test for screening would first have to be highly sensitive so it can diagnose all diseased persons. Second, for the test to be reliable and cost effective, it must be highly specific so people without the disease will not get false positive results.

Zimlichman noted that studies so far have shown the Medex Test to be significantly more accurate than the widely used test for occult blood in the stool for colorectal cancer, which has a sensitivity of only 50% and a specificity of 94%. The Pap smear for cervical cancer

has a sensitivity of only 51% and specificity of 98%.

The prostate specific antigen (PSA) test for prostate cancer has a sensitivity range between 18% and 46% and a specificity of 91% to 98%. By comparison, according to a study at the University of Milan's department of immunology, the Medex Test has a specificity of 81.2% and a specificity of 93.3% in diagnosing immune system disorders; a study at Tel Aviv Sourasky Medical Center's gastroenterology and liver disease department showed Medex had a sensitivity of 79.7% and a specificity of 90%.

Research carried out at Sheba's oncology institute by Dr. Ronnie Weitzen, Dr. Nava Epstein (head of research and development) and Zimlichman was presented at the May conference. They said their study, encompassing 122 patients with different forms of cancer, found that the Medex Screen system had an average correlation of 80% in diagnosing the existence of disturbances in the organs relevant to the cancer.

It was correct in 92.9% of prostate cancer, 78% of breast cancer and 76% of lung cancer cases. The Sheba researchers concluded that "the system has the potential to provide the medical community with an additional diagnostic tool that will enable patients suspected of having a malignant growth to be referred for the appropriate follow-up treatment."

A study at Sheba's cardiology institute showed that in patients with a suspected heart problem requiring catheterization, the Medex system identified heart disease with 85% accuracy. In their conclusions, the doctors wrote that the system had the potential to identify heart disease.

The system was found useful in occupational medicine at Holland's University Hospital of Groningen, where preliminary findings from a representative sample of 450 employees at different companies aimed at accurately diagnosing their medical condition without the researchers having any prior knowledge of their state of health. The conclusions of the study were compared afterwards with the subjects' medical files and, if needed, supplementary medical tests. The study showed a high degree of correlation between the results, at an overall level of 82.9%. The Dutch researchers noted that the system was particularly useful in diagnosing gastrointestinal disorders (90.11%) and spinal problems (85%).

Golan, an engineer who came on aliya from Iran in 1978, and Kanevsky, a neurologist from Moscow who immigrated in 1998, met in Arad "by chance," they recalled in a joint interview. Hearing Kanevsky - who developed the algorithms and coefficients to determine damage to internal organs - describe his medical application of Eastern and Russian reflexology principles, Golan offered to set up a company to conduct research and market it. The partners received a first grant from the Chief Scientist's Office in the Ministry of Trade and Industry and then a second grant, the two totalling \$700,000.

The device can be operated by a nurse or technician who undergoes a few hours of training. The data analysis and interpretation may be performed only by a physician trained (in a 15-hour course) by Medex Screen.

In addition to clinical studies in leading hospitals, various private clinics around Israel are already offering the test for \$80 to \$120. The company, which has offices abroad, also exports the device to a variety of countries.

Medicine is a conservative profession, and many doctors are suspicious of gadgets they don't understand. In an editorial in the same IMAJ issue in which Zimlichman's Sheba team presented their findings, Dr. Dov Gavish of the internal medicine department at Wolfson Medical Center in Holon was still skeptical after reading the Sheba study.

"The [Medex Test] diagnosis is very general and very non-sensitive, making this method unlikely to be helpful, at least in a hospital setting. The application of such a device in the general community has yet to be tested using sound methodology... I believe that a simple and straightforward medical history followed by a thorough physical examination is a far more accurate and simple method of diagnosis. However, screening tests and specific devices could be very useful if used in a well-defined population," he declared.

Dr. Raz Dekel of the Israel Defense Forces' occupational health branch, in a second accompanying editorial, notes that screening can be defined as the application of a test or procedure to apparently well individuals in order to separate those with a relatively high probability of having a given disease from those with a relatively low probability.

The Medex Test, he continues, "represents such an attempt, and a rather daring one, as it seeks scientific support for a technique that has never been used in Western medical diagnostics."

Prof. Yehoshua Shemer, director-general of Maccabi Health Services, deputy editor of IMAJ and a former director-general of the Health Ministry, declined to comment about Medex.

But Golan and Kanevsky believe in their product, and are determined. "Our aim is to give treating physicians new and effective tools for preventive medicine, to enable them to carry out their important work in the optimal manner. What differentiates the Medex test from most of the existing tests for identifying diseases and systemic disturbances is that the results are obtained immediately on conclusion of the non-invasive test. The findings are a confirmation or recommendation for further, more focused tests to clarify the suspicion of a disease, and in fact complement current accepted medical practices such as MRI and CT scans," they continued.

The partners envision the use of the Medex Test in general practitioners' offices and

emergency rooms for initial screening of patients and referral to specialists, depending on the results. The system can help doctors examine their patients and support their conclusions. It could even be used on air flights, they suggest, or in the military.

"We think it will eventually be recognized as the 'Israeli Nokia' - a product identified with the country that will promote the economy while saving money on unnecessary medical testing," Golan predicted.