

## PROFILES

### Israeli founder of simulation center changing the nature of medical training

By Leora Eren Frucht April 29, 2007

He learned how to eject from an airplane, land without an engine, and pilot calmly as smoke and flames threatened to engulf the cockpit. After hundreds of simulated and real flights under every possible condition, Amitai Ziv got his wings. But the combat pilot emerged from his Israel Air Force training with something else too: an idea that would eventually change the way medicine is studied - and practiced - first in Israel, and later, beyond.

"When a pilot has to eject for the first time, he has a feeling of déjà vu because he has done it so many times on a simulator. But young doctors are faced with many 'nightmare' scenarios that they have only read about," says Ziv, who went into pediatrics following his military service.

"In aviation, your first take-off is on a simulator. But in medicine, your first 'take-off' is on an actual patient. It seemed to me that the medical world had a lot to learn from aviation."

Ziv set out to adapt flight simulation training to the field of medical training.

The result is the Israel Center for Medical Simulation (MSR), a world leader in the field and already a model for similar centers in the US, Canada and South America.

This week, Ziv, the 48-year-old founder and director of MSR will be awarded the Charles Bronfman 2007 Humanitarian Award, in recognition of his accomplishments. The \$100,000 prize celebrates the vision and talent of an individual or team of people aged 50 and under, whose humanitarian works have contributed significantly to the world's betterment.

Upon entering the Israel Center for Medical Simulation - located at Sheba Medical Center, outside Tel Aviv - you may encounter a smoke-filled room with sirens blaring and gunfire staccato. Lifelike mannequins strewn on the floor, a frothing at the mouth distressed person may run past pleading for help.

In the next room there might be a staggering drunk with bottle in tow while down the hall or a doctor attempting to extricate a baby mannequin stuck in a synthetic "mother" mannequin womb with monitors beeping loudly.

"We can simulate virtually every medical setting: from an emergency room to a delivery room, from a pharmacy to a battlefield," says the trim, boyish-looking Ziv whose eyes light up when he talks about the center.

At the center, health professionals also undergo training in communication: Pharmacists face clients with prescriptions for drugs that interact adversely, physicians encounter victims of domestic violence and surgeons practice relaying bad news.

The simulations are a combination of what Ziv terms "low-tech" - some 30 trained actors -

and "high tech" - state-of-the art mannequins that exhibit vital signs like heart rate, blood pressure and oxygen saturation. Computerized mannequins, some specially designed for the center, can bleed, convulse or go into anaphylactic shock. All encounters are videotaped to enable health professionals to improve medical procedures and communication skills through debriefing sessions that follow.

"During the last Lebanon War, there was not a single doctor who went to the front without first refreshing his skills at MSR," Ziv told ISRAEL21c.

"It is not easy for a pediatrician who is used to dealing with ear infections to suddenly find himself with 80 injured soldiers. Many doctors told us that the training they underwent here was invaluable in preparing them for Lebanon," says Ziv, who continued to serve as a reserve combat pilot in the IDF until 1996, and is today deputy director of the Sheba Center, the largest hospital in Israel and, with 2000 beds, one of the largest in the Middle East.

While MSR helps prepare doctors for emergency situations - including chemical and biological warfare attacks - its main purpose is to train physicians in dealing with a myriad of other less chilling but equally challenging routine medical situations, some of which claim many more lives than terror attacks.

In fact, as many as 98,000 Americans die every year as a result of medical errors, according to the ground-breaking 2000 report, *To Err is Human*, by the Washington-based Institute of Medicine. One of the report's recommendations was the adoption of medical simulation instruction as a means of improving training and reducing errors.

"That is really an astonishing figure," notes Ziv. "It's the equivalent of a Boeing 747 crashing into the ocean every day. We would never tolerate such a thing in aviation, so why do we tolerate it in medicine?"

While still a student at Hadassah Medical School in Jerusalem Ziv began to explore ways to apply aviation to medicine. By the early nineties, he was using simulation to test the clinical skills of doctors in Spain, the Ukraine, Russia, Italy, and Brazil in a project for the US-based Educational Commission for Foreign Medical Graduates (ECFMG). Later, while doing his fellowship in adolescent medicine in Philadelphia, he and mentor, the late Dr. Miriam Friedman, were part of a team asked to develop and implement simulation-based licensing tests for foreign doctors wishing to practice in the US. Since their exam was adopted in 1998 no foreign doctor can practice medicine in the U.S. without demonstrating clinical skills through simulation.

While in Philadelphia a few of Ziv's air force buddies recruited him to join a start-up that was moving from aviation to medical simulators.

"They were ahead of their time," laments Ziv of the venture that failed to raise sufficient capital. The venture fizzled but Ziv's vision lived on.

"I wanted to change the whole concept of patient safety and the way we do medical education. My dream was to set up a national simulation center in Israel that would be a model for the world."

That opportunity came during a visit home. While lecturing at Sheba, then hospital director-general Prof. Mordechai Shani and current director Prof. Zeev Rotstein made Ziv an offer he couldn't refuse: the chance to build and head just such a center. Three years

later the MSR - a Hebrew acronym for Medical Simulation Center - became the first multi-disciplinary multi-modal center in the world with Ziv at its helm.

MSR now serves as a model for other simulation centers at leading hospitals in North America including the Mayo Clinic, the Cleveland Clinic/Case Western Reserve, and McGill University in Montreal. Ziv is also a consultant for hospitals in Brazil, Italy and other cities in Canada that are considering establishing such a center. He has testified before the US Congress on MSR's medical emergency preparedness programs and briefed the US office of Homeland Security.

Meanwhile, hundreds of American doctors have trained at MSR through the American Physicians Fellowship program and nurses from the U.S., Italy and Guinea have trained at the center as well. Recently Ethiopian doctors learned to enhance AIDS related skills through an MSR program that incorporates Amheric-speaking actors from Israel.

"The impact and accomplishments of Ziv are unsurpassed by any other physician dedicated to medical education," says Dr. William Dunn, Director of the Mayo Clinic's simulation center. "He has established a facility unlike any in the world. He's had an incalculable worldwide impact."

In Israel, the center has spurred a quiet revolution in medical training and practice. Three out of five Israeli medical schools requires candidates to undergo simulation-based personality testing at MSR.

"This is a major shift," explains Ziv. "Instead of choosing candidates with high marks alone we can select students who demonstrate compassion and other outstanding interpersonal skills in real-life situations - not just in an interview."

Before beginning an internship, all graduates of medical school in Israel are now required to complete an intensive 5-day training course at MSR, which exposes them to what Ziv calls "nightmare scenarios."

"They are alone in a room with a patient who has a heart attack; or they are in an elevator and realize they forgot to bring the patient's oxygen tank. The students say this is the most effective five days of their entire education. It's a place where they are encouraged to make errors, and learn the risks of the profession. They emerge humbled."

Since 2003, all anesthesiologists in Israel must pass a clinical skills exam, administered by MSR, that tests their competency in resuscitation, trauma management, crisis management in the operating room and other simulated scenarios. Similarly, no paramedic in Israel can get a license today without demonstrating his or her clinical skills in an MSR-administered test.

These factors make Israel a rigorous leader in terms of world licensing standards in several branches of medicine and some 30,000 medical professionals in Israel including doctors, nurses, social workers, pharmacists and physiotherapists have undergone training in a variety of hands-on experiential courses at the simulation center.

Ziv, an affable man with an easy-going manner, is the son of Canadian-born parents who immigrated to Israel in 1949. He grew up in Jerusalem, studied pediatric medicine at Hadassah Medical School, and adolescent medicine at the Children's Hospital in Philadelphia, and spent a year traveling through India following his service in the air force. He and his wife, Margalit, an educator, have three children; the oldest one, daughter Inbar, 21, is herself an Israeli army simulation instructor.

When Ziv started out in medicine, he flirted with the idea of becoming a neurosurgeon - something he now dismisses as "a macho trip." He was really drawn to what he calls "the softer side of medicine - educating and communicating" - and chose pediatrics. "Even as a combat pilot," he recalls, "I was involved in education. I would instruct other instructors and used simulation to do so; I role-played the dumb cadet," he laughs, "and they had to teach me to fly a loop."

As head of the MSR, and deputy director of Sheba - with responsibility for risk management and quality assurance Ziv no longer works as a pediatrician. "I miss that to a degree, but my passion is medical education and safety. That's where I feel I can have more influence and in an indirect way save lives by reducing medical errors."

Ziv's other passion is the in-depth study of Jewish texts - something he has pursued for several years in the framework of Kolot, a pluralistic beit midrash (Jewish study center).

Recently, Ziv helped launch a new program for health professionals run jointly by MSR and Kolot. Called Ailing and Healing, the program gives participants a chance to explore their roles as caregivers through Jewish text study and simulated real life scenarios.

When Ziv returned from the US in August 2000, he had another dream: "My hope was that MSR would be a resource for the entire Middle East. One month later, the intifada began."

Despite the rupture in Israeli-Palestinian relations, Ziv notes that MSR has been able to train a number of Palestinian doctors in trauma management. "You try to give your two cents to make this disturbed region a little more sane," he says. "And I still hope that some day medical education can be a bridge for peace."