



Dr. Geoff Fernie (left) checks in with Gilad Shoham as he reviews gelfAST engineering details in Toronto Rehab's rapid prototyping laboratory.

Wearable hand sanitizer

"Wash your hands." That familiar refrain from his mother—who was also a nurse—is etched in his childhood memory. It turns out that Mom was right.

Fast forward a few decades, and Gilad Shoham has become an industrial designer and inventor working in the hospital research laboratory of Dr. Geoff Fernie, Toronto Rehab's Vice President, Research. Gilad's brother, a doctor of infectious diseases in Washington, D.C., comes to him with a problem: What can be done to reduce the unnecessary deaths of thousands of hospital patients who get infections because busy health care workers wash their hands only 40% as often as they should?

From that question, a simple idea was born: to create a portable, easy-to-use product that allows doctors, nurses and other care providers to clean their hands before and after seeing each patient. In fact, the solution was so obvious that Gilad assumed somebody had already thought of it. It turned out that nobody had.

Gilad developed gelfAST, a small, wearable hand sanitizer that holds enough alcohol gel to last for a hospital shift. And with input from members of the Toronto Rehab research team and rapid prototyping in the hospital's lab, Gilad had a product to test with nurses on a unit in the complex continuing care program.

"Geoff was so helpful in the creation of gelfAST," says Gilad. "I don't think I would have been able to develop this product without his highly efficient family of researchers, and their collaborative and supportive environment."

But, how interested would hospitals be in gelfAST? The case was compelling. "Hospital-acquired infections kill more North Americans than all motor vehicle accidents, plane crashes and murders combined," says Gilad. "According to the U.S. Centers for Disease Control, half of the deaths are preventable by simple measures, primarily better caregiver hand hygiene."

Roughly one in 10 patients who enters an acute care hospital gets an infection they did not arrive with. Of these, 1 in 23 will die from this new infection.

Gilad's research predicted that for every 250 gelfAST units used (health care workers would typically use one



gelfAST Original (left) has evolved into gelfAST Anywear (right).

unit per shift), one infection will be prevented and for every 5,700 units used, one fatality will be prevented. "By increasing hand hygiene compliance rates from the current 40% to just 60%, the health care system could save more than \$2-million annually in an average sized hospital, over \$14,000 per bed per year."

Even armed with this information, the initial reception from hospitals was lukewarm. But the SARS outbreak in Toronto in 2003 "was a hugely defining moment for this product."

By the summer of 2005, Medonyx Inc. had been in operation for over a year with Gilad as CEO and orders coming in from across the country and around the world. A second-generation product called gelFAST Anywear was launched in 2006 in response to a clinical trial at Mount Sinai Hospital. Again, the support of the Toronto Rehab research team and the technology available in the hospital's rapid prototyping lab were invaluable. gelFAST Anywear is smaller, uses a recyclable cartridge of alcohol gel and its industrial look is gone. It is easier to use and can be worn around the neck on a lanyard, or clipped to clothing.

While the product is now making its way to the retail market and there are many other potential users including the food service industry, day care centres, police and other emergency services, Gilad is focusing on hospitals for now.



Gilad Shoham: Inventor a winner on CBC's Dragons' Den

transmission of infections is reduced," says Dr. Fernie. "It's exciting but the technology is top secret and we can't say much about it yet."

With a goal to help people live as independently as possible, Toronto Rehab's iDAPT research enterprise looks for partners who have the "greatest probability of helping us get ideas from the laboratory into use so they are available to people." The research labs focus on moving a

can save lives



Need it. Do it. Done. Hand sanitizing is easier than ever before with gelFAST Anywear (www.gelfast.com).

From the beginning, gelFAST has attracted attention—first as Gold Prize winner in the prestigious 2004 *National Post* Design Exchange Awards; then in its debut at the 2005 World's Fair (Expo 2005) in Aichi, Japan, as one of a select number of Canadian-designed inventions; and now as a winner on CBC Television's *Dragons' Den*, where inventors pitch their products to a team of potential investors. On the October 11 episode, Gilad's presentation of gelFAST attracted a \$250,000 investment.

Medonyx has also joined several other private companies and Toronto Rehab's iDAPT research team in a project under the leadership of Dr. Fernie to "develop new systems that will offer a radically different and hopefully more effective method of ensuring that the

concept from design and rapid prototyping, through field testing and to market quickly for the benefit of people with disabilities, or in Gilad's case, to help save the lives of inpatients and reduce costs to the health care system.

With flu season beginning and increasing public awareness of the potential for a flu pandemic—about 10% of Ontarians get the flu each year while an estimated 35% are expected to get pandemic flu over the course of a breakout—increasing hand hygiene compliance in hospitals and at home is an idea whose time has come.

As Dr. Allison McGeer, Director of the Department of Infection Control at Mount Sinai Hospital and a SARS survivor, says: "If you think prevention is expensive, try disease." 