American Healthcare Professionals and Friends for Medicine in Israel
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Interventional cardiologist Dr. Eyal Ben-Assa regularly journeys to the depths of the heart.

The Beersheba native, and a 2015-2016 APF Fellow, is an expert on the way blood flows in the cavities of the heart. He is advancing his research in this innovative field at the Harvard-MIT Biomedical Engineering Center at the Massachusetts Institute of Technology in Cambridge.

“For years, we were blind to a whole part of our physiology due to the lack of technology,” says Ben-Assa. “But now, we are shining a light on another aspect of cardiac physiology that will have its whole chapter in cardiovascular textbooks.

“Most of the imaging modalities we use today are showing us the way the walls and valves of our heart move, but we have never seen how blood actually flows,” Ben-Assa says. “My interest lies in the dynamics of blood flow inside the heart, inside its cavities.”

The Tel Aviv resident says that now we have the non-invasive means, via advancements in imaging, to view blood flow in the heart.

MRI and sophisticated ultra-sound techniques are used to help measure that blood flow. Ben-Assa studies the flow characteristics of blood in the left ventricle, which pumps oxygen-rich blood from the heart to the body.

“In a normal heart, the anatomy of the ventricle and its valves direct the blood flow in a very characteristically efficient manner that minimizes effort on the part of the heart,” Ben-Assa says. “And once we have a diseased ventricle or a diseased valve all this flow pattern is disrupted, making the heart work harder… and eventually to fail.

“We believe we can describe the pathologies of the heart also from this point of view -- how disease diverts and changes the natural blood flow. This will help us better understand the physiology of diseases and will help us better build devices that will restore blood flow.”

Ben-Assa completed a bachelor’s degree in biology at The Hebrew University of Jerusalem. He then received his M.D. at Hadassah Medical School. Before that he’d been in IDF elite and K-9 units.

Prior to his APF Fellowship, the 40-year-old was a senior physician in the cardiology division at Sourasky Medical Center in Tel Aviv. Upon his return, he will have a position in Sourasky’s interventional cardiology unit.

His wife, Maria, 34, is a pharmacist and an IDF major who specializes in health management. She is a Wexner Fellow (awarded to those showing excellence in Jewish professional leadership) completing a master’s degree in public administration at the John F. Kennedy School of Government in Cambridge.

They have two children: a son Yuval, 8 and a daughter Tamar, 4.

Ben-Assa has a family background in medicine which affected his career path. “My grandfather was a physician. I grew up under his influence. He was a Zionist from the

Netherlands who decided to go to the south of Israel to help people in need. There he established the health system for the Bedouin population in the Negev. His legacy definitely shaped my decision to become a doctor.

“Later on I had my own adventures… I was wounded in the military and found myself in the hospital for about four months. It gave me a new outlook on the interpersonal relationships between physicians and patients -- from the perspective of the patients.”

After he finished his biology degree he had a chance to complete a doctorate. But Ben-Assa decided he wanted more interaction with people and chose to make the transition to medicine.

“During my medical training I kept combining the clinical and research paths, but I see myself as a clinician. The interaction with patients is one of the main things I value.”

During medical school Ben-Assa was chosen to spend a semester at UCLA.

The UCLA medical school experience was amazing, he said. It provided about 4 months of clinical work that was “the gateway to better understanding of medicine here in the US, which has proven very useful. And it made it easier later on to interact with physicians in the US.

“I learned a lot about the differences between the Israeli and US medical systems, both good and bad.”

He also said he felt very much “hugged” by the Los Angeles Jewish community, much like he feels living in Brookline right now. “You get invited to Shabbat and holiday celebrations, to services and are welcomed into people’s homes and families. It’s wonderful.”

Ben-Assa did his internship at Barzilai Medical Center in Ashkelon (in the south of Israel) and did research in the Clinical Pharmacology and Toxicology Unit at Assaf Harofeh Medical Center, in Rishon Le Zion (south of Tel Aviv).

He completed his residency in internal medicine at Sourasky in 2012 and his cardiology fellowship there in 2015. During his residencies Ben-Assa taught medical students and will continue to teach, at some level, when he returns. He notes he also spent a very rewarding time as a faculty member at his undergraduate alma mater teaching cardiovascular physiology.

“During my internal medicine residency I decided to become a cardiologist. In cardiology I can combine my clinical interests as well as my desire to perform interventions and innovative research.”

His mentor Dr. Shmuel Banai, the director of interventional cardiology at Sourasky, taught him not only to perform procedures but also to understand their physiological implications.

Together they decided that, in order to maximize his potential as an interventional cardiologist, Ben-Assa needed to combine research and clinical work in his training.

“At that point I started to study with him the way blood flows inside our heart cavities.” He chose to continue that work at MIT, in the laboratory of Elazer R. Edelman, M.D., Ph.D., because it is one of the world’s leading laboratories in this field.

“It was absolutely necessary to leave Israel for this experience. The Edelman lab is a unique place. It’s a combination of state-of-the art and unique facilities and world-renowned cardio-vascular researchers.

“In the lab we work together-- physicians, biologists, chemists and engineers. Everyone comes to one another with questions, comments and answers.

“And Elazer, with all of his knowledge and experience in both medicine and engineering, just kind of melds us together.”

Ben-Assa spends about 10 hours a day on intra-cardiac flow analysis research. One of the things he does is analyze, on computer screens, cardiac images of blood flow from ultra-sounds and MRI’s. Dad also works some nights after the kids are asleep and on weekends. His schedule is flexible, allowing for school pick-up, drop-off and caring for children. On weekends the family has enjoyed travel around New England and to Canada.

The Israeli researcher/clinician also “shadows” Edelman who treats patients at Brigham and Women’s Hospital in Boston.

While Ben-Assa has participated in the publication of about 30 journal articles and presented research internationally, he says his MIT experience is a time to do, for the first time, “correct and profound research. “Here is a school to teach me how to perform proper research. It is the ‘gold standard’ of research.”

He says he will be content if two years of work bears the fruit of only one or two publications. “Because I know these will be high-quality pieces from which the medical community can truly learn.”