



# American Healthcare Professionals and Friends for Medicine in Israel

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**Dr.** Yitschak Biton is an electrician for the heart.

The 39-year-old Lod (about 9 miles SE of Tel Aviv) native is a 2016-2017 APF Clinical Fellow in Cardiac Electrophysiology at Massachusetts General Hospital (MGH) in Boston.

*Cardiac electrophysiology (EP) is the study of the electrical system of the heart. The heart is charged with moving 4,300 gallons of blood each day through the body's intricate vascular network. Although displacement of blood is its primary function, each and every of the 100,000 beats generated daily is initiated and finely regulated by electrical impulses that originate in the heart itself.*

"In cardiac electrophysiology we implant and manage devices, such as pacemakers and defibrillators, to regulate heart rhythms. We also scar ("ablate" by burning or freezing) small areas of the heart to prevent abnormal electrical signals. And we deal with many different medications to control atrial fibrillation and ventricular tachycardia – abnormal heart rhythms.

"But before making any decisions, we do electrophysiology studies testing the heart's electrical activity in order to locate an arrhythmia (abnormal heartbeat). Results help doctor and patient decide on necessary treatments, including surgery," says Biton. Cardiac electrophysiologists do not perform subcutaneous procedures such as open heart surgery or practice "interventional cardiology" such as angioplasty.

When the former cardiac fellow at Chaim Sheba Medical Center (located in the Tel HaShomer neighborhood of Ramat Gan, in the Tel Aviv District) finishes his two-year fellowship at MGH he will actually have been away from home for four years. Before Boston he was a Postdoctoral Research Fellow at the world-renowned Heart Research

Follow-Up Program at the University of Rochester in Rochester, New York. The program houses the world's leading research group for clinical trials of sudden cardiac death.

In fact, Biton's family enlarged by one just after they got to Boston. The family now includes: Dad; Mom Heyl-el, 33, an accountant working on a doctorate in accounting at Boston University; daughter Helani, 2 ½ and son Ari, 9 months. "It's all been very hectic," he says.

Biton, who lived in Ramat Gan before leaving for the United State in 2014, knew at a very young age that he was going to become a doctor. "I was seven years old and I even knew I wanted to work with sudden cardiac death.

"The reason behind this decision is that there is a high incidence of sudden cardiac death in my family. My maternal grandfather and two of my maternal uncles died suddenly of cardiac problems and this was my motivation. I was not born when they died but there are the stories, my mother's stories, and she expected us to study medicine. My younger brother is a medical student. "

In high school Biton specialized in science and mathematics, requirements for medical school. After IDF service he attended The Hebrew University Hadassah Medical School in Jerusalem.

He did a general internship at Wolfson Medical Center in southern Tel Aviv, during which he chose two electives of two months' total in which he did cardiology. Then Biton chose a residency in cardiology at Chaim Sheba, Israel's largest hospital.

He actually made the choice of sub-specializing in cardiac electrophysiology during his time in Rochester. "I was still hesitant when I applied to Rochester, but my tendency was toward this field. However working with Dr. Arthur Moss, one of the

most famous people in the world in cardiac electrophysiology, really finalized my plans. Moss, my mentor, is part of the group that invented the defibrillator.

“Working with Moss cemented what I just love about this area – it has the combination of clinical thinking, intervention and follow-up.”

Follow-up is something close to Biton’s heart. Sharing patients’ lives is an important reason he chose the cardiac electrophysiology field. “You have more interpersonal time with the patients (as opposed to say... with cardiac surgery) and I enjoy it. You can see the people over time and see how things evolve. You get to know the families and sometimes work with familial syndromes. It’s a good feeling and often very very interesting.

“Everything that medicine can offer is really implemented in this field.

“And then there is research -- there are still so many things not known specifically in this field, many topics to be explored; so this is a great field in which to be able to contribute.”

Research is very important to the young cardiac electrophysiologist. “One of the reasons I didn’t want to become a surgeon was because I felt that if you want to do research you’re best off doing it within internal medicine and cardiology.”

Biton is what’s considered a “physician/scientist.” He’s published widely and abundantly in many prestigious journals and has presented a great deal of research, often abroad. In 2016 he was an American College of Cardiology Young Investigator Awards finalist.

At MGH Biton has no protected personal research hours. He has to squeeze them into his spare time. “How much I get done a week varies, on a bad week I get in about 10 hours, on a good week, up to 20.”

Since his arrival in Boston he has published about five articles. His focus is on Long QT Syndrome, a problem in the heart’s electrical system having to do with a delay in the time it takes for the electrical

system to recharge after each heartbeat. Long QT can be acquired or genetic. Biton is studying the genetics of Long QT3 and implications for treatment.

All this is done around a 60 plus-hour-MGH work week.

Is it intense?

“Very.

“A regular week is five days, 7 a.m. to about 8 p.m., or later than that. Every two months you have ‘clinical service’ which is two weeks in a row, 7 a.m. to 8 p.m. no days off. During the weekend you are on call 24/7.”

What’s a work day like?

“On a regular week we’re doing mostly procedures: implanting pacemakers and defibrillators and doing ablations – delivering radio frequency energy to the source of the arrhythmia, destroying a small part of the heart by burning or freezing it. This requires mapping the heart and finding the source of the arrhythmia. We use X-ray, ultra-sound and MRI as well as insertion of catheters and electrodes. It’s using all the technology we have in medicine. Most ablations are done under general anesthesia and they take up to four hours, sometimes longer. We might do two a day.

“A pacemaker or defibrillator implantation can take up to three hours. They are done without general anesthesia. We might do three or four a day.

“We see patients in clinic half a day a week and when I’m on ‘clinical service’ I take all the consults in the hospital.

“Also, I have to study about procedures and attend lectures three times a week in the mornings. I attend national, regional and international meetings. We attend rounds and do a lot of reading, a LOT of reading. There is a major portion of our work to be read from books and journals because the field is always evolving and there is always new data with which you need to be familiar. And of

course, there's a lot of teaching, all the faculty members are really into teaching.

"The fellows also teach general cardiology fellows."

(A note on teaching -- In Israel Biton was an enthusiastic Tel Aviv University medical school teacher on the wards and in the classroom. "I taught internal medicine and cardiology and I enjoy it a lot. Fresh minds bring new questions. That's really, at the end of the day, what medicine and research is all about. Very bright minds keep you on top of things. Teaching keeps you fresh in your areas of medicine. I really enjoy it." He won "best teacher" award twice and plans to continue teaching upon his return.)

Did you have to leave Israel to get the kind of educational experience offered at MGH?

"Yes.

"There is no such formal fellowship program in cardiac electrophysiology in Israel. And the volume of procedures done at MGH far surpasses what I could see at even the busiest hospital in Israel.

"For example, we do at least 20 ablations a week here, whereas in Israel it's not more than four or five a week at a hospital.

"As for implanting devices – here we do about 30 or 40 a week, in Israel, while it depends on the hospital, it's maybe 10 a week.

"Also, we are a referral hospital, we get cases that are more complicated. Sometimes it's a 'redo' and sometimes it's a first time.

"We also see more of the rare syndromes and rare arrhythmias you might only read about in books.

"People come from all over to MGH. Sometimes even from other parts of the world. It's one of the top five in the world for this type of medicine."

How did you choose Mass General in particular?

"When I was in Rochester and was a finalist for the Young Investigator award, someone from MGH sent me an E-mail inviting me to apply. I did and I got in. Mass General had already trained four Israeli physicians and each one had had a good experience here. I know three of the four personally. I just didn't apply elsewhere."

While Biton has traveled extensively for work, the family has not traveled or done much in the way of tourism. "It's been very busy for all of us, especially with the new baby. But it's all good."

When you return to Israel what would you like to do with your Mass General experience?

"There are certain procedure being done only sporadically, with maybe three people doing them, such as highly sophisticated ablations – ventricular tachycardia and atrial fibrillation ablations. I would like be able to offer the country more opportunities to have these procedures.

"I also want to implement the most advanced technology and impart the knowledge I've gained to other Israeli physicians."

Biton wants to thank APF for himself and all the other fellowship recipients.

"I know APF has to help train a generation of physicians and we don't take this money for granted. It is very much appreciated."

## **American Physicians Fellowship for Medicine in Israel**

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