



# American Healthcare Professionals and Friends for Medicine in Israel

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**W**ith each transplant surgery Dr. Yaron Barac is born again.

“Seeing the heart start to beat or the lungs inflate and turn pink after transplant is like seeing the creation of the world every time ... from scratch. It’s like the rise of the sun over the darkness of space. It’s a first breath-taking, heart-beating moment every time for me!” he says.

The 41-year-old Jerusalem native is a 2016-2017 APF Clinical Fellow in Duke University’s Heart Failure Program as well as aortic surgery in Durham, N.C. He specializes in heart and lung transplants and in implanting “technological solutions to heart failure, as well as in aortic surgery,” he says.

Before he left Israel he was an attending cardiothoracic surgeon at Rabin Medical Center in Petach Tikva (near Tel Aviv). There his experience with transplanting organs and surgically implanting assistive devices, including artificial hearts, was limited.

Assistive technology can act as a “bridge to transplant” (keeping someone alive and healthy enough while awaiting transplant) or as permanent life-saving treatment.

These are the newest assistive technologies available to help prolong life:

**ARTIFICIAL HEART** – a prosthetic device implanted into the body to replace the original biological heart.

**ECMO** -- extracorporeal membrane oxygenation -- a temporary mechanical support system used to aid heart and lung function in patients with severe respiratory or cardiac failure, developed as an offshoot of cardiopulmonary bypass.

**LVAD** -- left ventricular assist device -- The left ventricle is the large, muscular chamber of the heart that pumps blood out to the body. An LVAD is a battery-operated, mechanical pump-type device that’s surgically implanted. It helps maintain the pumping ability of a heart that can’t effectively work on its own. It pumps blood from your left ventricle into your aorta (the main artery in the human body, originating the heart and extending to the abdomen).

**RVAD** – right ventricular assist device -- A right ventricular assist device pumps blood from your right atrium into your pulmonary artery and to the lungs.

Barac says this new field is a subspecialty that has grown up due to the rapid expansion of both the population of patients with heart failure and of diagnostic and therapeutic options for their management.

Dr. Rabea Asleh, an APF Mayo Clinic Fellow in Advanced Heart Failure and Transplant Cardiology, tells us that devices and transplants can “buy” significant quality time for patients.

“The one-year survival rate with optimal medical therapy only is about 25 percent in patients with advanced heart failure and the two-year survival is less than 10 percent; with heart transplantation the one-year survival rate is about 90 percent and 85 percent at two years.

“With LVAD as destination therapy the one-year survival rate is around 75 percent and the two-year survival rate is around 60 percent.”

Based on recent studies, these therapies, compared with medical therapy, have markedly improved patient survival and quality of life. And results continue to improve as the technology improves

and researchers and clinicians have more experience with these devices.

"The issue with only medical therapy is that there is no actual healing," Barac says. "Medicine will only let the time pass and the patient will die. There is no true survival gain."

The Barac family of five comes from Kibbutz Ramat Yohanan in Northern Israel (about ½ hour from Haifa) and includes Dad; Mom Shikma, 39, an organizational behavior lecturer; sons Hadar, 11 and Jonathan, 3 and daughter Mika, 8.

They will stay in the United States for two years and have already enjoyed a trip to Asheville, in North Carolina's mountains, as well as Walt Disney World in Orlando. The family has connected with the Jewish community in Durham and there are many Israelis in the area. The older children attend a Jewish day school while the youngest attends a Jewish child care center. Barac says he and his family enjoy their temporary Southern location very much, even though there's lots of rain compared to Israel and the winters seem very cold.

Barac, who has been in the IDF since age 18, knew at 8 that he wanted to be a heart transplant surgeon.

"My grandfather suffered from heart failure. And after reading an article in the newspaper, I understood that this (transplant) was the only cure for his disease." In high school he took math and science courses necessary for medical school.

After four years in the army, he attended medical school at Technion. "I chose military service first, because I felt it was the right thing to do. I remain in the reserves as a Major in Special Forces – a trauma physician."

After an Internship at Rambam Health Care Campus in Haifa, he completed his cardiothoracic surgery training at Rabin Medical center.

But when Barac finished medical school he'd also completed a PhD in cardiac electrophysiology.

Cardiac electrophysiology studies test the heart's electrical activity to find where an arrhythmia (abnormal heartbeat) is coming from. The results can help patient and clinicians decide whether treatment involves one or a combination of the following: medicine, a pacemaker, an implantable cardioverter defibrillator (ICD), cardiac ablation and or surgery.

"While I didn't follow up on cardiac electrophysiology as a profession, I believe, in your career, you should try and get knowledge in as many subjects as possible. Your comprehension of diseases will be much better.

"And cardiac electrophysiology is really at the base of it all. That's the heart beating and there's nothing more important than this in the lives of cardiac patients. So I decided to broaden my knowledge in this arena before I focused in cardiac surgery."

Another element "at the base of it all" according to Barac, is the physician/patient relationship, which he enjoys tremendously. "I think that patient survival and success in rehabilitation starts in the human interface. Actually, I don't *think*, I *know* that one's relationship with one's surgeon is a big part of the rehabilitation process. The healing process starts in the brain of the patient and I think this starts by creating a special bond between the surgeon and patient.

Did a medical mentor teach him this?

No, his grandfather did.

"My grandfather always told me, 'Be a mensch first, then a doctor, then a surgeon and then a researcher. My grandfather was a very good and smart man and I was very fortunate to get his life wisdom."

In the same vein, Barac also enjoys teaching. He taught physiology and cardiac physiology to medical students at Technion and has also taught nursing students. "Teaching is a privilege. Not only do the bright minds and clinicians of tomorrow keep you on your toes, it's a very important part of becoming a good surgeon, because by teaching you yourself

are learning. The more you are diving into stuff and understanding things better, the more you are going to succeed in the practice of medicine.”

Did you have to leave Israel to get this educational experience?

“Yes. There is just no program like this is Israel. What with the volume and variety of patients and the experienced people.”

Why choose Duke?

“That’s very easy – it’s the best place in the world.

“It’s the ‘gold standard’ here – people, physical plant, research – anything you can ask for is here. People come for this from all over.

“And the teaching environment is excellent. People all around are very communicative, they know how to teach, they are very much aware of how to do it and are very committed to doing it well.”

Is it intense?

“VERY!

“A good day is 15 hours long; a bad day may last three days. Sometimes over the weekend I get time off, sometimes I don’t.

“An operation may take anywhere from four to 12 hours, depending on many different things and we do more than one a day.

“It’s a very very demanding job. Sometimes I go without seeing my family for two days at a time or more. There are two fellows, so I’m on call at least 50 percent of the time. That means, 24/7, I may be called for whatever is needed for transplant.”

“What is needed” includes everything from medication to treating transplant rejection.

Barac says he works “300 percent of the time, with 200 percent devoted to clinical work and 100 percent devoted to research.” Since this is technically a clinical fellowship, he doesn’t have protected research time. “I just try to fit it in when I can.”

His main research interests are in trying to find different solutions for heart failure and to improve the transplant process and cardiac recovery post LVAD implantation.

Prior to Duke Barac was also a Tel Aviv University Medical School faculty researcher and published about 20 journal articles and presented research abroad.

He’s working on publishing various pieces dealing with his first year’s work in North Carolina.

Barac considers himself a physician/surgeon/scientist/entrepreneur. “But, of course, I can’t be all that while I’m here at Duke!”

He has several patents and, with others, has created a medication for heart failure. He’s also won many grants and awards, including being chosen one year as one of the most promising Israelis by Globes Magazine (the Israeli equivalent of Forbes or The Wall Street Journal).

What do you hope to do with your Duke experience when you return to Israel?

“I will be part of the group at Rabin leading heart failure patient care in Israel. (Including Barac, the team will now feature two surgeons with his training.) In Israel I will be making these surgical experiences more widely available and will also bring novel methods and knowledge into this field at home.”

## American Physicians Fellowship for Medicine in Israel

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