



American Healthcare Professionals and Friends for Medicine in Israel

2001 Beacon Street, Suite 210, Boston, MA 02135

Dr. Barak Cohen opens back doors, searches nooks and crannies and hidden passages of medicine to locate key information to solve vital, often life and death, riddles surrounding the surgical experience.

The 39-year-old anesthesiologist was an APF 2016-2017 Research Fellow studying “perioperative outcomes” at Cleveland Clinic. He is now finishing his second year in the department of Outcomes Research, part of Cleveland Clinic’s Anesthesia Institute.

“Perioperative outcomes research is fascinating! You’re finding and solving medical mysteries all the time – leading to improvements, and sometimes even breakthroughs, in the way we treat our surgical patients, influencing the whole practice of anesthesia and medicine.”

Cohen defines *perioperative outcomes research* -- “Perioperative outcomes research is the research of the various parameters and factors that influence the outcomes (mortality, morbidity, complications) of people before, during and after undergoing surgery.”

Some factors that have been discovered over the years include patient temperatures during surgery and oxygen levels during surgery. “Lately we have also been looking at the association between blood pressure during surgery and patients’ outcomes. And now we know that blood pressure levels during surgery really do change surgical outcomes.”

The Holon (in the Tel Aviv district) native said that while other medical disciplines conduct similar research, anesthesiology is very active in this field because these professionals, “see the whole picture. They decide whether patients can stand the procedures for which they’re scheduled, plan how to keep them safe during surgery and deal with all possible complications during surgery. And they

deal with patients in the immediate post-operative period in the recovery room. In Israel, anesthesiologists also often take care of the most complicated cases, those that end up in the intensive care unit. Many of the physicians in Israeli ICU’s are anesthesiologists because this is an integral part of their training.”

Cohen, a senior attending physician in anesthesia in the division of anesthesia, critical care and pain management at Tel Aviv Sourasky Medical Center, decided to become a doctor early in high school. “I was always interested in sciences and took the required curriculum for medical school. But there was no specific moment in my life that made the decision for me. More than anything it was the education I received at home.

“I come from a family environment that placed a high value on contribution to the community, to society – very altruistic. My father was in the IDF for many years, as an officer in the Israeli Air Force.

“So when it came time to join the army I thought about how I could contribute the most and what I could do that was truly significant – in terms on helping others on a personal level and serving my country. So I decided to combine my interest in medicine and becoming an officer by experiencing the military through a physician’s eye, so to speak.”

Cohen was accepted into the IDF’s exclusive Academic Atuda. This is a program enabling high school graduates to defer the draft, allowing them to attend university prior to military service. After they complete their studies they join the army and serve in positions that fit professional knowledge gained during their studies.

Cohen attended The Hebrew University Hadassah Medical School. It was there he became interested in anesthesia. “In medical school I had a life-altering experience. My father, who was always a role

model for me and a very central figure in my education and life, was admitted to Hadassah Medical Center for two months, hanging between life and death. He suffered a surgical complication from a common procedure and went into profound septic shock. This was after my rotation in anesthesia and critical care. And, although I was interested in anesthesia in medical school, I really fell in love with the field while watching those specialists care for my father."

Anesthesia is a unique field of medicine. Cohen says. Most people have brief exposures to it and don't understand it. They think of it as simple, not complicated. But in any procedure, anesthesia is the key to success, he believes.

"And it's full of high-adrenaline moments, which I love. You must stay calm and be ready to face emergencies at any moment. You must be ready to predict and to treat. It's very challenging. Everything happens very quickly in anesthesia. It's seconds, not hours or days or even minutes.

"I love the fact that you need to use your knowledge every day – anatomy, physiology, chemistry and more. It doesn't stay in the textbooks. It really makes things much more interesting.

"Also, there's a tremendous amount of diversity -- different health situations and different ages. One day it's a perfectly healthy woman giving birth and the next day it's a very old person undergoing a complicated procedure. Or maybe it's a 4-year-old or a casualty of war. Sometimes it's that very healthy woman giving birth whose situation suddenly deteriorates.

"While quite a hard job, it's fascinating every day. It's also very satisfying because you get to go home almost every day knowing which lives you saved. It's not months later that you find out."

At 25, after completing his internship at Shaare Zedek Medical Center in Jerusalem, where he'd chosen extra study in anesthesia and intensive care, Cohen began active duty in 2004.

He served in the IDF concomitantly until 2015, first as an infantry medical officer and last as Head of

the Radiation Medicine Section of the CBRN Medicine Branch at the IDF Surgeon General's headquarters. The CBRN deals with protection of civilians and soldiers against "non-conventional" warfare, Cohen says.

One particularly meaningful assignment was as part of a 2012 humanitarian operation in the Golan Heights for Syrian civil war victims. "It was a unique field hospital located at a military post on the Israel-Syria border. For the first few months I was the only anesthesiologist working there.

"The effort lasted a little more than a year, open for two or three weeks at a time, depending on need.

"It was a great honor to be a part of this amazing humanitarian aid mission conducted by a small group of people."

During his military service, Cohen completed his residency in the division of anesthesia, critical care and pain management at Tel Aviv Sourasky Medical Center.

He chose Sourasky because of Dr. Idit Matot, the division's head. "She's a very charismatic person, a remarkable physician and researcher – very well-known in Israel and abroad. I had a one-hour talk with her and decided 'that's the place for me.'

"This division at Sourasky is one of the largest and most active in Israel. It has one of the finest research, clinical and teaching programs in Israel and getting a residency spot there is very competitive.

"Dr. Matot turned out to be my mentor. With all of her other activities as division chair, she's still the best anesthesia clinician I can think of. And she's the perfect model of what we now know is very important – a knowledgeable physician with good patient interaction. She's very warm and compassionate, taking extra care of patients to make sure they are comfortable and safe at all times.

"Anesthesiologists usually meet their patients and their families at their most vulnerable moments. We need to be kind and to be appropriately informative no matter the hour of the day or how

tired or busy we are. Every expression you have, every word you say, you can never afford to be wrong. It's very profound."

In 2010 he also received a master's degree in Health Administration from Ben Gurion University of the Negev.

The Cohen family of six: Dad; Mom, Dr. Chen Sirota-Cohen, 38, a diagnostic radiologist doing a research fellowship at Case Western Reserve University; sons Itamar and Ido, ages 12 and 2 and daughters Neta and Naomi, ages 9 and 6 came to Cleveland from Yahud (near Tel Aviv).

They have traveled quite a bit, to destinations including: Canada, Niagara Falls, Washington, D.C., Florida and The Rocky Mountains. "It's all been exceptional," said Cohen.

Let's talk more about perioperative outcomes...

How did you get into this sub-specialty?

"Dr. Matot works in this area as well and, as I said, she's been a big influence on me. She encouraged all sorts of research during my residency. The field of perioperative outcomes is a field that has several arenas in which I find great satisfaction working – research, clinical care, public health and health management. It heavily influences the management of millions of patients undergoing surgery each year around the world. Therefore, it is a great opportunity to improve healthcare on large scale.

"It's amazing that there is this field that has such a large influence on surgery outcomes."

Why did you choose Cleveland Clinic?

"I knew of Dr. Daniel Sessler, chairman of the outcomes department at Cleveland Clinic, for his unique and important cutting edge research. His is the most prominent name in the world in this field.

"In 2014 I first met him when he was in Israel to attend a conference for which I was head of the organizing committee. That's when we decided I should study with him.

"Dr. Matot said, 'To do good research, go to the best.' This is the best, more than you can imagine.

"Here, at this huge and famous place, you get to see things practically no one else does," Cohen says. "There are only a few groups in the world that do this level of high-quality research in this field and this place is the largest.

"It is a remarkable opportunity for me to interact with and learn from the most experienced researchers, those who are able to conduct clinical studies that are simply not possible to perform in most other places."

Cleveland Clinic's department of outcomes research is also the headquarters of the world's largest clinical anesthesia research organization, the one-of-a-kind Outcomes Research Consortium (ORC).

The world-famous ORC is made up of about 150 investigators in 20 countries, with appointments at about 30 universities. The group, founded more than 25 years ago, is typically running about 100 simultaneous studies. It publishes an editorial or a research paper every four to five days, more than 80 a year, according to Cohen. "And they're all on perioperative medicine that can influence surgical outcomes."

In Cleveland, where Cohen is now chief of about 15 fellows (an elected position), researchers undertake large clinical studies, with as many as thousands of participants. "We do no small studies with 30 or 40 people."

Fellows sometimes run their own projects, recruiting participants, running interventions, doing everything needed.

"Here we also have very large data bases of which we can ask questions and get answers. For example, I'm looking at different ways to reduce pain after surgery -- various forms of pain relief and delivery systems, including epidurals. We found out about this question by looking in data bases at results with previous patients. So, we started by examining existing data, then went onto the clinical phase a few months ago. We aim to enroll nearly 700 patients in this multicenter trial.

What other topics have or are being explored?

1) Temperature of patients undergoing anesthesia

-- "The ORC discovered its relevance about 20 years ago. When they started, no one thought it was important. Now everyone knows it is crucial."

2) Cardiac events after surgery – a problem overlooked until recently -- In patients older than 45, cardiac injury after non-cardiac surgery is a major cause of death, Cohen says. "About one percent of patients die within a month after surgery and many will die of 'MINS,' myocardial injury after non-cardiac surgery." The ORC helped identify this problem and figure out who's at greater risk for it. Most who are at higher risk show no indication of potential harm unless you perform specific blood tests. "Testing is gradually becoming the standard of care and is actually changing the way we practice medicine. Now we are investigating how to prevent the one percent from dying."

3) Blood pressure and surgery – "We now know that blood pressure levels during surgery really change outcomes. For example, low blood pressure during surgery is associated with kidney injury.

4) Ways to reduce pain after surgery -- "It really matters whether patients are in pain after surgery. It truly affects healing. We are comparing analgesics and delivery systems.

"We are running a few major studies on this topic using treatments that can, for example, reduce post-operative pain and not rely excessively on opioids, with their known complications and side effects" says Cohen. He is running one of the studies and helping with others.

5) Oxygen levels and surgery – "Researchers have been debating whether different levels of oxygen supplied during surgery influence the healing of surgical wounds, as well as other outcomes.

"Research started almost 20 years ago and there

have been dozens of studies done on this topic with no consensus. Now the Outcomes Research Department is trying to finally answer these questions with a huge, very well-designed study. They were able to enroll almost 6,000 participants in an attempt to answer these questions, that's practically unheard of.

They did it in a little more than three years. It will be published soon and hopefully it WILL end the debate."

What's a typical day like?

My day starts at about 6:00 a.m. in the operating room. For most of my studies I have to enroll people who will go into the OR. I have to make sure participants are enrolled properly, make sure they are in the correct groups, communicate the study details to the treating physicians, etc.

Overall, we run trials, do data base research, come up with new projects, coordinate with other fellows' projects at Cleveland Clinic and interact with other sites in the ORC.

Since I'm the chief fellow up to $\frac{1}{2}$ of my time is spent doing management things as well, which I enjoy very much.

I finish up at about 6 p.m. or so. There is no weekend work.

What do you hope to do with the experience gained in Cleveland?

"These are unique research skills I intend to bring back home. This knowledge and experience in conducting large multicenter clinical trials is very much needed in Israel. We aim to establish a nationwide research network that will be able to conduct high-quality anesthesia research across Israel. Moreover, the future collaboration with the international consortium will bring Israel's anesthesia research to new levels of recognition and prestige worldwide."