



# Not your average robot:

## Leading-edge technology is revolutionizing health care

**Dr. Ivar Mendez, Chief of Neurosurgery at the Queen Elizabeth II Health Science Centre in Halifax, can provide follow-up care for his patients via the robot.**

By Shannon MacDonald

**D**r. Ivar Mendez, chief of neurosurgery at the Queen Elizabeth II Health Science Centre in Halifax and chair of the Brain Repair Centre, is taking the concept of universal access to specialized care to new heights with the introduction of Canada's first-ever remote-presence robot.

"In 2002, we were dealing with very long waiting lists for neurosurgery," recalls Dr. Mendez. And, with the only team of specialized neurosurgeons in the region, patients requiring specialized neurosurgical procedures were required to travel to Halifax for consultations, surgery and follow-up. The issue was compounded by a reduction in operating



**The robot, operated by Dr. Mendez from his office, travels through the hospital's corridor to visit each patient with Parkinson's.**

time in Halifax. The only solution: find a way to deliver expert neurosurgical care in community-based hospitals throughout the region.

### **Changing neurosurgical care**

Five years later, Dr. Mendez and his team have revolutionized neurosurgical care in Atlantic Canada by developing leading-edge technological tools to deliver expert care to patients, regardless of where they live or where their physician happens to be.

"The program developed in stages," says Dr. Mendez. "Our first solution was the introduction of a robotic arm that neurosurgeons in local hospitals would use with assis-

tance from specialists in Halifax." This allowed the team to treat patients closer to home and to support very competent neurosurgeons in performing complex procedures, but the applications were limited.

The second phase focused on movement disorders, specifically on people with Parkinson's disease. Waiting lists were growing while operating room time was being reduced. "For example, people with Parkinson's were waiting three years for deep brain stimulation (DBS) surgery. We needed to find a new way of working," says Dr. Mendez. But the problem was about more than simply transporting the human expertise. Highly specialized procedures like DBS require sophisticated technology and infrastructure, neither of which was available in community-based hospitals.

### **Making care portable**

So, Dr. Mendez began working on the idea of being fully portable. "If we were going to perform DBS in a local hospital, we needed a stand-alone computer system capable of doing electrophysiological recordings during the procedure." The result fit into a briefcase and travelled with the team to St. John, New Brunswick, where they significantly reduced the waiting list for DBS. Patients were still required to travel to Halifax for their follow-up programming appointment.

"Our goal was always to care for people close to home, so although we had found a way to perform the surgery locally, we were not satisfied because they still needed to travel for follow-up,"

recalls Mendez. The team began working with In Touch Health, a California-based technology company, to develop Canada's first-ever remote-presence robot. Already, Dr. Mendez can see the day when a fleet of at least five robots are working throughout the region.

### **Interacting in real time**

With the body mass of a small adult, the robot resembles a large vacuum cleaner with a flat screen on top (where the physician appears in real time when operational). It's not nearly as fancy as R2D2 from *Star Wars*, but don't be fooled: this



**Howard Bonnell (seated) chats with Dr. Mendez (on screen), who is working from his office.**

machine houses state-of-the-art technology that allows for a seamless, real-time interface between doctor and patient. Its camera delivers a 180-degree view, with full 360-degree rotation and tilting of the screen. Its small stature was designed intentionally to allow for better eye contact with patients.

"I can examine a wound, speak to patients, residents and nurses, and proceed with the best course of action, just as if I was there," says Dr. Mendez. "Just last week I was delivering lectures in Geneva and London, but with the robot, I was able to do rounds with my

patients every day."

One of the technological highlights is that the robot does not require advanced telecommunications infrastructure; instead, it uses a regular broadband Internet connection accessed via a laptop. And, according to Dr. Mendez, it takes just 15 minutes to learn how to operate the robot, so anyone can use it.

### **Following-up close to home**

For people with Parkinson's, the robot now offers the capacity to do follow-up programming and care close to home. Dr. Mendez

simply logs on to activate the robot and works with a local technician to perform the procedure. "I can see the programmer and how the patient is responding in real-time. The programmer responds to my instructions. The next logical step is to develop a direct interface connection to the robot so that I can do the programming remotely."

Testing is underway to measure the responsiveness of patients to the

robot, as well as its efficiency and effectiveness. Approximately 30 Parkinson's patients in Cape Breton are taking part in remote DBS programming this summer.

Dr. Mendez is excited about the technology and the wide range of applications the robot has across all fields. However, it is the impact that this technology has on care delivery that Dr. Mendez speaks about most passionately. "This innovation allows us to live our values as Canadians: to deliver the best standard of care, when needed, regardless of the patient's location, in real time."