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Doctor in a box

Dr. Ivar Mendez is using robotic medicine to change the way care is delivered to remote communities, in this country and beyond

BY ABIGAIL CUKIER • Saskatoon

Patients and colleagues are often surprised to learn that neurosurgeon and scientist Dr. Ivar Mendez is also an accomplished sculptor who has published four books of photography. Yet the Saskatoon MD believes there's a strong relationship between art and medicine. "They may appear to be different activities, but to me they are part of the same continuum," he said. "Creativity is important for an artist. You must imagine something that doesn't exist and create it. It's the same for science. You need to think outside the box to solve a problem."

Over the past decade, Dr. Mendez has harnessed his creativity by testing robotic medicine's ability to provide specialized care in remote communities. "Supposedly, all Canadians have the same access to health care, but this is not true," he said. "Being in a remote area of Saskatchewan is not the same as being in Toronto or Montreal or, even, Saskatoon." Currently, Dr. Mendez is leading pilot projects in his home province and his country of birth that utilize telemedical technology for remote care in neurosurgery, pediatrics and infectious diseases.

Mobile medicine

Born in Bolivia, Dr. Mendez and his family immigrated to Canada when he was a teenager. His resume reflects his long fascination with the brain and its ability to produce thought: After earning his PhD and medical degree from the University of Western Ontario, he accepted fellowships in neurosurgery and cell research, before taking a position at Dalhousie University, where he eventually became head of the division of neurosurgery. In 2000, he founded the Brain Repair Centre, a multi-institutional health research organization in Atlantic Canada, and continues to study the use of stem cells to repair the brain after trauma. In 2002, he was part of the Halifax team that performed the first long-distance telementoring neurosurgery, using a robotic arm to remove a tumour in a patient over 400 km away in Saint John, N.B.

Two years ago, Dr. Mendez moved across the country to become the head of surgery at the University of Saskatchewan and the Saskatoon Health Region. As a clinician and scientist, his research focuses on functional neurosurgery, brain repair, stem cells, robotic neurosurgery and computerized systems in neurosurgical applications. A year ago, he started a pilot project with a team of physicians from Saskatoon's Royal University Hospital that uses a robotic device to triage children and manage their care in remote areas of Saskatchewan.

Dr. Tanya Holt, director of pediatric critical care at Royal University Hospital, explains the process when physicians normally triage transports by phone. "We ask a lot of questions, and typically take the most conservative approach because we are not certain of everything," she said. "However, seeing the patient is so different because we can be more aggressive in management. Local caregivers also like to see your face."

The device used for this pilot project consists of a video screen and camera on top of a wheeled base. A physician can activate and control the device remotely using a computer or tablet. The physician's face appears on the video screen and they are able to converse with whoever is on the other end, in real time.

According to Dr. Mendez, the Saskatchewan government spends $53 million a year on transporting patients who are acutely ill or need specialty care. "By decentralizing medical care, we're able to offer access to timely medicine that is cost-efficient and means no travel for patients," he said.

Dr. Mendez has a number of telemedicine projects in the works, affording him different opportunities including mentoring OR residents from a distance and following HIV patients in remote areas of the province. There's even a portable robot, the Doctor in a Box, which can be taken anywhere.

Practical applications

Dr. Mendez is also using robotic technology to provide care in his home country of Bolivia, where he previously founded the Ivar Mendez International Foundation to institute programs for school breakfast, dental care and computer education. "Bolivia is one of the poorest countries in the world," he said. "You can't control where you are born and I believe you should contribute to help individuals who are not so lucky."

Dr. Mendez explained that hundreds of women in Bolivia die each year during childbirth from preventable conditions, because they don't have access to ultrasounds. He has sent one Doctor in a Box to Bolivia, which is allowing caregivers in remote villages to perform prenatal ultrasounds with the help of physicians in urban centres. "They may not have electricity or doctors, but they have cell signals in the Andes and they can charge cell phones with a car battery," he said. Using a computer or tablet, an obstetrician from the city can manipulate the camera and use video communication via a cell signal. A nurse in a remote area can plug in a portable ultrasound and put the probe on a woman's abdomen and the physician can see the baby in real time. If there is an issue, the woman can be transported to the medical facilities.

Closer to home, Dr. Mendez recently launched a study using Doctor in a Box in Saskatoon ambulances, allowing paramedics to perform ultrasounds at the scene or during patient transport. The hope is that this will allow the hospital to be better prepared when the patient arrives. "This is the next logical step of my career—to be able to provide expertise," Dr. Mendez said. "Now we can teach professionals in other places. We are not just helping, but transferring knowledge." **MP**

Dr. Mendez, pictured here with a medical robot, believes telemedicine can decentralize health care.