

Courage Leads to the Stars



Dr. Mehran Anvari experiences zero gravity conditions during his trip to the NASA Space Centre.

St. Joseph's Healthcare Hamilton surgeon Dr. Mehran Anvari recently returned from a two-week visit to the NASA Space Centre in Houston, Texas. The telerobotics pioneer was exploring ways to extend the frontiers of medicine into space.

The founding director of the Centre for Minimal Access Surgery (CMAS), and expert in laparoscopic surgery, pushed those frontiers into new territory earlier this year when he performed the world's first hospital to hospital telerobotics-assisted surgery. Anvari, assisted by Dr. Craig McKinley in North Bay, successfully operated on a patient across 400 kilometres from his computer console in the OR department at St. Joseph's in Hamilton.

The National Aeronautics and Space Administration (NASA) is looking for that kind of skill, experience and vision as they investigate ways to deal with possible health problems faced by astronauts. Dr. Anvari is helping to break new ground that may eventually lead to the possibility of an Earth-bound physician performing surgery on a patient orbiting

on a space station, on the moon, or even another planet.

Dr. Tim Broderick, a surgeon/scientist working with NASA, invited Anvari to the Space Centre to take part in early experiments on surgery in space. Broderick was on-hand last February to watch the Hamilton-North Bay procedure that used fibre optics. "Our work has significant implications for space, and as we're the only site in the world doing this kind of work, he's been keeping a very sharp eye on us," said Dr. Anvari.

Dr. Anvari headed south with Dr. McKinley, CSA astronaut Dr. Dave Williams and Bell Canada's Harvey Stein - who designed the network for the telerobotic program.

"The primary purpose of the trip was to be part of a series of experiments to look at the effect of zero gravity on completion of laparoscopic tasks. We used simulated environments to test the ability of the surgeon, an astronaut, and some technical staff who'd been trained to perform a variety of laparoscopic skills under zero gravity conditions," said Dr. Anvari. "We also presented to a multi-lateral medical operations taskforce made up of the medical directors of various space agencies on telerobotic surgery and its implications for space."

Anvari said that his aim is not just to develop technology for space. "We want to develop technology that will help Canadians. Satellite technology could open many remote corners of the country which don't have land-based facilities, yet need medical services."

There is a Canadian Space Agency (CSA) satellite outside the Charlton Ave. hospital site of St. Joseph's Healthcare Hamilton with which Dr. Anvari is investigating the possibility of doing telerobotic surgery using satellite technology, rather than the current land-based (fibre optics) technology.

The first week in Houston was taken up with experiments and on-site training. Although Anvari trained for six months prior to the visit, he needed further orientation to face the next challenge. He took off in the so-called 'Vomit Comet'. The KC-135 plane takes its passengers on a rollercoaster ride that simulates weightlessness, or microgravity.

"I trained physically to make sure that I was fit. Clearly, with the KC-135 flight, the fitter you are the more likely you are to be able to complete your

task without being affected by the constant changes in gravity from 2G to zero G and the impact that has on your body. Fortunately the people in our group were fine and had no problem," said Anvari.

"It was a fantastic experience to experience zero gravity and see how everything feels and floats away in zero gravity. It was great to be able to get to know some of the astronauts, to get a feel for how NASA works, and to present at a high level to the heads of the medical directories of the space agencies."



The results from the experiments are now being analyzed.

The future however is open. "We hope to continue the collaboration and in fact to extend it," said Dr. Anvari. "We are going to continue some further zero G experiments, but we are also hoping to do some testing of telerobotics at Aquarius - the underwater station off Florida which mimics space station conditions. At least two of the astronauts or maybe more would be involved. We would then be able to see if it is possible to deliver tele-surgery with the astronauts."

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