Researchers develop robot that performs brain surgery

BRUSSELS, Belgium: An EU-funded team of researchers has developed a robot able to help neurosurgeons in performing keyhole brain surgery. The robot was tested for its accurate performance during tests on dummies. The team believes it can be used to help physicians treat their patients for epilepsy, Tourette’s syndrome and Parkinson’s disease.

The robot is claimed to have incredible memory and accuracy in performance, especially because it has 15 types of movement compared with the four available to human hands, as well as haptic feedback—physical cues allowing physicians to assess tissue and perceive the amount of force applied during surgery.

The ROBOCAST (Robot and sensors integration as guidance for enhanced computer assisted surgery and therapy) project received €3.45 million under the “Information and communication technologies” theme of the EU’s Seventh Framework Programme.

Led by the Politecnico di Milano university in Italy, the ROBOCAST partners developed hardware experts call mechatronics, which constructs the robot’s body and nervous system, as well as intelligence software. The software comprises a multi-robot system, an independent trajectory planner, an advanced controller and a set of field sensors.

The ROBOCAST consortium developed the mechatronic phase of the project as a modular system with two robots and one active biomimetic probe. These were integrated into a sensory motor framework to run as one unit.

The first robot has the ability to locate its miniature companion robot through six degrees of freedom, and moves from left to right, up and down, and backwards and forwards. It also has three rotational movements, namely forward and backward, side to side, or left to right. These all work together to locate the robot’s companion anywhere in a 3-D space. The robot, say the researchers, can also ease the tremor of a surgeon’s hands up to tenfold.

The miniature robot holds the probe that is used through the keyhole. According to the researchers, optical trackers are located at the end of the probe and on the patient. The force applied is managed by the robot, which also controls the position using a combination of sensors.

This allows it to determine the trajectory of the surgical work.

According to the developers, the path the robot follows inside the brain is determined on the basis of a risk atlas and the evaluation of preoperative diagnostic information.

The ROBOCAST team comprises experts from Germany, Israel, Italy and the UK. Future research plans include investigating robotic neurosurgery for patients who would remain conscious during their surgery.

Gulf’s first ever mobile diabetes clinic prepares for tour launch

The Emirates Diabetes Society’s ‘Win Over Diabetes’ mobile clinic is in its final preparations to begin its journey across the United Arab Emirates (UAE), with the first visit taking place in the rural area of Al Lusaily, between Dubai and Al Ain, on Saturday 28 January.

Inaugurated in Dubai last December at the prestigious International Diabetes Federation-sponsored World Diabetes Congress, the mobile clinic patient initiative will act as an education, disease consultation and treat-
ment facility, utilizing eminent medical specialists and offering services to patients in the remote areas of the nation, where access to specialized diabetes treatment is a challenge.

"Al Lusaily is the first regional stop for the 'Win over Diabetes' mobile clinic, which will be providing hope for the country's diabetes sufferers. Controlling this debilitating disease is a matter that can be tackled through lifestyle changes, not only in terms of diet and exercise but also through better compliance with prescribed medication - a shortfall here in the UAE. We are dedicated to providing an exemplary standard of care to patients that may not have access to any, due to their remote locations. Staffed with volunteer specialist including top physicians and disease educators, the mobile clinic aims to change that," said Dr. Abdul Razzaq Al Madani, Head of the Emirates Diabetes Society.

The day-trip will allow specialists on board to carry out diabetes screening, provide examinations and consultations for diabetic patients, and provide wider medical education to physicians, patients and nurses in the area to aid effective management of the disease and also reduce the staggering rate of diabetes in the local population.

The Win Over Diabetes mobile clinic is also fully equipped to provide screenings to the residents of Al Lusaily, which will involve blood glucose, blood pressure and lipid testing, together with the monitoring of other important vital signs.

Diabetes mellitus is the fourth leading cause of death by disease globally, and is the leading cause of blindness and visual impairment among adults in developed countries.

According to the World Health Organization, the prevalence of diabetes is highest among member countries of the Gulf Cooperation Council (GCC), ranging from 11.5 to 30%, with more than 20% of the local population affected in the UAE. This makes diabetes management imperative for all the stakeholders in UAE.

The 'Win Over Diabetes' mobile clinic campaign intends to cover all seven UAE emirates over a 12-month period, with specialist health care practitioners onboard making visits to the country’s many hospitals, healthcare clinics, and community centres.

Organizers of the 'Win Over Diabetes' mobile clinic campaign also point out that the mobile clinic tour is not only intended to screen UAE residents for diabetes but also to offer treatment and care optimization in remote areas, including:

- Diabetic patients also suffering from complications such as hypoglycaemia
- Weight gain in diabetic patients due to a lack of effective management and even, in some cases, awareness of their illness
- Patients with diabetes-associated illnesses such as high blood pressure (hypertension) and abnormal levels of fats/cholesterol in the blood (dyslipidaemia)

The Win Over Diabetes mobile clinic is a joint patient service initiative between the Emirates Diabetes Society and Swiss pharmaceutical company, Novartis - one of the leading pharmaceutical companies worldwide, offering partnership in patient-oriented services beyond the innovative medications across different therapeutic areas.