

Canadian Surgical Technologies & Advanced Robotics

Minimally invasive surgery (MIS) and robotics technologies have revolutionized a host of surgical approaches and promise superior patient outcomes, less trauma, faster recovery times and the opportunity to perform long-distance procedures. From developing regional brain cooling techniques to applying robot technologies for clinical use, researchers and clinicians at Canadian Surgical Technologies & Advanced Robotics (CSTAR) are setting international standards for surgical technology, treatment innovation and minimally invasive patient care.



CSTAR is a world leader at integrating research, development, testing and commercialization of novel MIS and robotics techniques and approaches.

What is CSTAR?

- A world-class, 22,500-square-foot research facility seeking to close the gap between medical device innovation and clinical implementation through research, validation and simulation training
- Provides access to world-class acute and chronic health laboratory facilities that support preclinical testing and validation of emergent medical device technologies
- Promotes the implementation of new technologies and techniques into clinical practice through research, education and health technology assessment and validation
- Allows London's researchers, engineers, medical teams and industry collaborators to solve surgical care problems, commercialize new technologies and capture a significant share of the multi-billion-dollar market
- A partnership between **Western University, Lawson Health Sciences Centre, Lawson Health Research Institute** and **St. Joseph's Healthcare**

Research and Training

- CSTAR's members are engaged in an extensive range of MIS research, including mechatronics, haptics, robotic controls and tissue modeling
- Has initiated a major program employing minimally invasive robotic assistance, image guidance and intraoperative navigation to ablate malignant tumours in solid organs
- Although highly acclaimed as a robotic surgery research centre, CSTAR has a growing reputation for skills beyond robotics, including such areas as histopathological assessments of bilateral ureteral stents, advancement of microsurgical techniques for skull-based tumours and use of ultrasound for delivering pain blocks
- CSTAR and its partners created the **Brent and Marilyn Kelman Centre for Advanced Learning** – a high-tech facility where students, trainees and surgeons from around the world train in the latest surgical, interventional and robotic advances using sophisticated simulation equipment

Notable Achievements

- Since its formation in 2001, CSTAR has recorded many world, North American and Canadian firsts in the fields of computer-assisted surgery, tele-surgery and surgical simulation
- Researchers developed a minimally invasive tactile imaging device that enables surgeons to detect tumours hidden deep within the lungs and helps them feel tumours and remove them without spreading the ribs
- Home to a da Vinci® robot – a novel system with four interactive arms and instruments that work like wrists to perform complex procedures with an unprecedented degree of dexterity, precision, control and range of motion
- CSTAR was the first Canadian centre to use the robot to perform coronary artery bypass (CAB) surgery, laparoscopies, prostatectomies and hysterectomies
- In 2008, CSTAR scientists also used it to perform the world's first robot-assisted intestinal bypass surgery for superior mesenteric artery syndrome
- Performed Canada's first minimally invasive robot-assisted mitral valve repair and the world's first CAB on a beating heart, which was enabled by advanced technology in CSTAR's specialized *Hybrid Operating Room/Angiosuite*, which is one of the few such facilities in the world

For more information, please visit: www.lhsc.on.ca/About_Us/CSTAR



**Western
Research**