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## More Treatments, Better Health Care Medical Device Technologies

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Medical device technologies, which range from simple thermometers to sophisticated diagnostic imaging equipment, represent one of the world's fastest growing economic sectors. With over 1.5 million devices already on the market, and 3,000 new ones entering it every year, the sector is closing in on annual revenues of \$1 trillion.

Health care cannot be delivered without medical devices. With aging populations and emerging economies, the demand for innovative medical devices is going to increase. Here are some examples of ground-breaking medical device technologies that are resulting in better health care for Canadians:

### 1 Ward of the 21st Century

The W21C is an initiative based at the University of Calgary that serves as a research and beta test-site for prototypical hospital design, novel approaches to health care delivery, human factors research, and innovative medical technologies.

### 2 Arctic Front Advance

Medtronic's Arctic Front Advance is the world's first cryo balloon indicated in the treatment of Paroxysmal Atrial Fibrillation (PAF). The Arctic Front Advance cryoballoon delivers a refrigerant through an inflatable balloon to freeze tissue and disable unwanted electrical circuits that contribute to PAF.

### 3 Engage Biomechanics

York University's Engage Biomechanics is developing a wireless sensor platform for pressure ulcer care tracking. A nurse knows when to turn a bed-ridden patient with this platform, which brings sensor networks and the power of the cloud to medical data.

### 4 CT Perfusion for Diagnosis in Acute Stroke

CT perfusion for diagnosis in acute stroke at Lawson Health Research Institute allows existing CT scanners in hospitals to measure tissue blood flow via a software program developed in Dr. T.Y. Lee's lab. GE Healthcare has licensed the software for use on their CT scanners to study stroke, cancer and heart attack patients. Doctors are better equipped with this technology to diagnose conditions rapidly and recommend appropriate treatment.

### 5 Techna Institute

Techna is a new institute at the University Health Network (UHN), established in collaboration with the University of Toronto, and devoted to the advancement of health technologies. Its mission is to shorten the time interval from technology discovery and development to application of such technologies for the benefit of patients and the healthcare system, and to facilitate the convergence of basic investigation, technology development and translational research.

### 6 Ultrasound Monitoring of Breast Cancer Chemotherapy (WaveCheck)

Sunnybrook Health Sciences Centre and MaRS Innovation co-developed WaveCheck, an ultrasound technology that transforms conventional equipment so that physicians can monitor a breast cancer tumour's response to chemotherapy. This new Ultrasound tool can determine if the therapy is working or not within two weeks.

### 7 UBC Medtech Innovations

The University of British Columbia (UBC) is building a culture of moving medtech innovations into practice: the Sterilizable Drillcover lets surgeons in developing countries use regular hardware store drills instead of expensive and unavailable surgical drills (Engineers in Scrubs); the SmartDrill gives trauma surgeons x-ray vision without x-rays when they're fixing broken bones (Traumis Surgical Systems); Aspect Biosystems' 3D bioprinting platform will provide human tissues on demand, reducing the need for animals in drug discovery and ultimately addressing the shortage of donor organs (Aspect Biosystems).

### 8 ShoeBOX Audiometry

ShoeBOX was originally developed at the Children's Hospital of Eastern Ontario (CHEO) Research Institute. Ottawa start-up company Clearwater Clinical has essentially reinvented the audiometer for current practice – merging mobile device technology and traditional audiometry functions to meet modern hearing testing needs. The iPad based Shoebox audiometry solution allows doctors and clinicians to perform critically needed testing anywhere, with the same tone thresholds obtained by traditional audiometry systems.