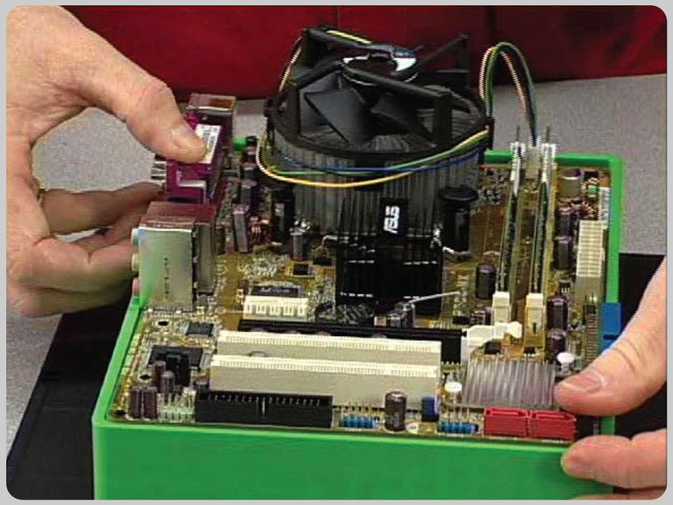
# George Brown College and U of T:

## "Diagnosing a Way to Deliver Care, Anywhere"



### ABOUT GEORGE BROWN COLLEGE

George Brown College, with 30,000 full- and part-time students and more than 900 faculty in more than 150 programs, aims to be a top community college of choice for applied research investment by industry and other partners. Its applied research strengths include advanced engineering and microelectronics; nursing and the social sciences; health informatics; IT; and design and new media. George Brown is currently allied with nine other Ontario colleges in the Colleges Ontario Network for Industry Innovation, started with a $3.5m grant from the Ministry of Research and Innovation. CONII is building college capacity to bring research to the marketplace.

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Imagine a person, a child, let's say, in a place, at a point in time. The child is ill, with one or more of the preventable, treatable infectious diseases that kills one-third to two-thirds of the world's children: influenzas, AIDs, malaria, tuberculosis or diarrhea. A sample of blood is taken. What then?

Too often in countries around the world, there is neither the human nor the technological means to fully assess the child's blood in order to treat the illness, and to share treatment information with other health care providers - too few doctors, too little information or technology for analysis, not enough time and not enough money.

These are the challenges that the University of Toronto's Laboratory of Collaborative Diagnostics (LCD), guided by Professor Peter Pennefather and West Suhanic, envision doing something about. They contacted Professor James McIntyre of George Brown College's Centre for Advanced Engineering Technologies to help them develop capacity in an underdeveloped sector: networked services for remote home care.

Such a new collaborative diagnostics service would not only serve children anywhere for diagnosis. Other researchers could also develop and expand the system to other home care services and all kinds of patients in Canada and around the world: to monitor and advise on medications, to track and locate frail or ill people at home, as well as to monitor physical signs and symptoms of health and wellness.

Researchers at George Brown and the LCD foresee a well-designed, easily usable system for nurses and other health professionals. The doctor, the lab, the databases, and/or the data readout equipment could be accessible several kilometers, or several thousands of kilometers away, via networked workstations and internet connections to central systems.

Having developed the computer software to support a diagnostic network, Pennefather and Suhanic asked McIntyre to provide three critical kinds of interface in the LCD's design plan. McIntyre's work on the project is supported by an applied research grant from George Brown.

First, the U of T lab needed a research team that understands how to connect technology product design with nursing users. "Many innovations," says McIntyre, "die when it comes time for the customer base to adopt them into regular practice. Systems are often designed with a lack of understanding of the clients and end up cumbersome and inconvenient, with no perceived value.

"But at George Brown," he adds, "Advanced engineering, health informatics and nursing education are three cornerstones of what we do. We focus on both the user and the technology. The college's engineering students will also have the chance to design and build new devices for integration into the homecare monitoring prototypes, and nursing faculty will be involved in prototype testing.

Second, LCD needed specialized packaging expertise and facilities to rapid-prototype three to five computer cases, housing all the essential electronic components, and circuitry, which could then proliferate into numerous workstations specialized for homecare delivery. Casing and cabling are the bridges that connect the local environment and its USB-driven tools—a blood-pressure cuff, microscope, or a camera, for example—to the diagnostic network.

Third, McIntyre and his microelectronics lab are experienced in configuring their innovative electronics with existing consumer computer and sensory devices. Says McIntyre, "Interfacing with available technologies is often difficult, yet it saves money, and the products' familiarity tends to encourage users' actual use of the system." Rapidity and adaptability of the components that George Brown develops are key, given the ever-changing market of consumer electronic and computer products, and the different health and homecare settings and devices that will be connected to the system.

The partners' innovation, once developed, tested and commercialized, may be a just-in-time innovation. User acceptance, evidence of cost effectiveness, and industry's concern about R&D costs top the list of obstacles to developing home health care technologies, even as provincial governments pledge, based on demographics and health care costs, to keep aging Canadians in their homes longer.

The LCD's adaptive manufacturing project, collaborating across two public institutions and using many existing electronics, is expected to deliver a number of homecare services on a barebones system for $300. Such success will position the Laboratory of Collaborative Diagnostics and George Brown's Centre for Advanced Engineering Technologies to respond to the obstacles, and to launch a more comprehensive joint research program with private partners in future.

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