Volume 5, Issue 4 2010

UNIVERSITY OF OTTAWA HEART INSTITUTE
INSTITUT DE CARDIOLOGIE DE L'UNIVERSITÉ D'OTTAWA

THE BEAT™

A COMPENDIUM OF INFORMATION ABOUT THE UNIVERSITY OF OTTAWA HEART INSTITUTE

HIGHLIGHTS

Anesthesiologists at the Heart Institute have become national leaders in [transesophageal echocardiography] education, particularly in the emerging field of three-dimensional echocardiography.

(from Cardiac Anesthesiology: Training Outside the Box, page 1)

"Intensive care can be a very intimidating nursing placement, but with the Heart Institute course, I felt prepared and eager to start my new nursing role."

— Julie Lukus, Nursing Trainee, UOHI (from Education for 24/7 Patient Care, page 2)

The Heart Institute's Biomedical Engineering program is widely regarded. Its innovative work in battery management has garnered a good deal of attention on both sides of the border and won Timothy Zakutney the Outstanding Canadian Biomedical Engineer of the Year award.

(from Spreading the Word about Clinical Engineering, page 3)

"Education is really emphasized, and people here want to teach—they volunteer to do it, they're happy to do it and they're good at doing it. That culture of being very passionate about teaching and doing it well sets this place apart."

— Dr. Michael Froeschl, Cardiologist, UOHI (from In Conversation, page 4)

IN THIS ISSUE

The Beat is published by the University of Ottawa Heart Institute (UOHI). Comments or questions about *The Beat* should be directed to Jacques Guérette, Vice President, Communications, at 613-761-4850 or jguerette@ottawaheart.ca. For more information about UOHI, please visit www.ottawaheart.ca.

As a teaching hospital, the University of Ottawa Heart Institute trains doctors, nurses, researchers, technologists, physiotherapists and more in the science and treatment of heart disease. With a passion for education and all aspects of cardiovascular medicine integrated at a single site, the Institute is widely recognized for its unparalleled training.

Cardiac Anesthesiology: Training Outside the Box

The University of Ottawa Heart Institute is a leading centre for training in cardiac anesthesiology, from rotations for medical residents to full- and multiyear specialty training for currently qualified anesthesiologists. But the teaching interests of the Cardiac Anesthesiology clinicians range beyond the standard medical curriculum, and several have developed innovative educational opportunities to broaden the experience of trainees who pass through the Institute's wards.

Teaching Real-Time Cardiac Imaging

Echocardiography, the use of non-invasive ultrasound to picture the heart's structure and function, is a mainstay of cardiac diagnosis and monitoring. Traditionally, echocardiography has been performed transthoracically, meaning that external probes image the heart via ultrasound waves transmitted through the chest wall.

However, a newer method called transesophageal echocardiography (TEE) takes advantage of the fact that the heart lies close to the esophagus, the pathway that carries food from the mouth to the stomach. TEE uses a small probe on the end of a flexible line that can be threaded down the patient's esophagus, imaging the heart from its back side.

Without the chest wall, ribs and lungs in the way, TEE provides a better picture of the heart (see image on p. 2), and the procedure can be carried out during cardiac surgery to provide real-time feedback on the progress of an operation.

Because of their experience in the operating room handling patient sedation and intraoperative procedures, "anesthesiologists, particularly cardiac anesthesiologists, have become experts in doing intraoperative echocardiograms," explained Dr. Christopher Hudson, a staff anesthesiologist at the Heart Institute. "We've learned to use intraoperative TEE to help make decisions regarding management of blood circulation, and also to give the surgeon information following a repair about whether or not that repair has worked."

TEE is primarily used in valve surgery, particularly mitral valve surgery, said Dr. Hudson. The aim in mitral valve surgery today is to repair rather than replace a valve. TEE allows surgeons to noninvasively determine whether a valve can be repaired. "Once the repair is done and the patient comes off bypass, you can immediately assess whether the repair was successful. The last thing you want is for a patient to leave the OR with an unsuccessful repair," he explained.

Surgery teams at the Heart Institute also use intraoperative TEE during aortic valve replacement to look for leaks in newly attached mechanical or bioprosthetic valves and in coronary bypass surgery to assess blood flow after blood-vessel grafting.

Anesthesiologists at the Heart Institute have become national leaders in TEE education, particularly in the emerging field of three-dimensional echocardiography. "That's really where echocardiography is moving, and we're trying to be on the forefront of that," said Dr. Hudson.

All cardiac anesthesiology fellows at the Heart Institute receive training in TEE and are required to write the national PTEeXAM to become certified advanced practitioners in perioperative echocardiography. Staff also provide training, on request, to practicing anesthesiologists from other institutions in Canada and abroad.

Cardiac Anesthesiology staff conduct peer-to-peer TEE training through professional conferences and classes. In June, Dr. Hudson, Dr. Stéphane Lambert and Dr. Benjamin Sohmer presented on three-dimensional TEE at the Canadian Anesthesiologists' Society meeting, and Dr. Hudson and Dr. Lambert are scheduled to teach a related class at the annual international echocardiography training course administered by the Society of Cardiovascular Anesthesiologists.

"We're introducing the idea and the benefits of 3-D and its potential new uses—we're trying to disseminate that information and encourage people to learn 3-D TEE," said Dr. Hudson. "We're using it now for mitral and aortic valve surgery, so we've seen the benefits in terms of providing insight into how a structure in the heart is working."

(continued on page 2)

(Cardiac Anesthesiology: Training Outside the Box, continued)

Teaching the ABCs of Difficult Conversations

Intensive care units (ICUs) are filled with a hospital's sickest patients, requiring around-the-clock specialized care. Not surprisingly, ICUs also have the highest mortality rates of any unit in a hospital.

Consequently, doctors who staff ICUs often must have sensitive discussions with patients or, in cases in which patients are too sick to communicate, with the patients' families.

"You deal with death a lot in the ICU, and many people find it difficult to do well," said Dr. John Macdonald, an intensive care medicine specialist and anesthesiologist who joined the Heart Institute this year. He previously worked at hospitals in Ottawa and Peterborough and remains a regular serving Lieutenant Commander in the Canadian military, serving three tours in Afghanistan in the past four years.

Ideally, explained Dr. Macdonald, difficult conversations would be led by the patient's primary doctor or another physician who had worked extensively with a patient and family members and had established a rapport. But in reality, things often don't work out that way.

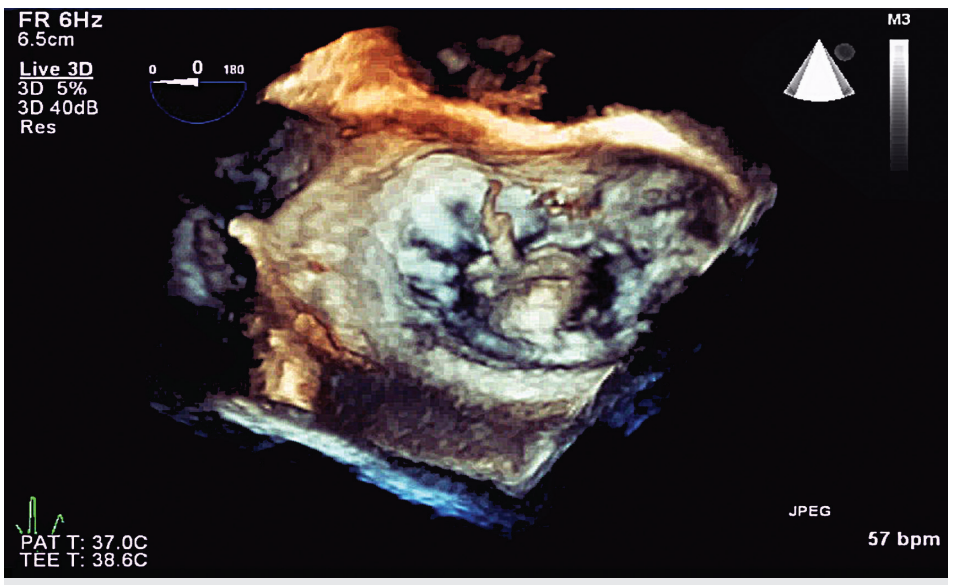
"A lot of high-acuity situations requiring these conversations happen at night when it's the trainees in hospital. And our trainees are finding these discussions one of the most stressful parts of their rotations—having to discuss end-of-life issues, such as withdrawing life support or giving poor prognoses—either with the patient, or the family, because the patient is intubated and sedated. Lack of communication training is a huge issue," he explained.

To remedy what they saw as a gap in the training of residents rotating through the ICU, Dr. Macdonald and a colleague, Dr. Mike Hartwick of The Ottawa Hospital, designed a course, taught over two half days to teach trainees how to rapidly establish and, importantly, maintain rapport with patients and their families during these difficult discussions.

The course begins with classroom training that explains the steps of successful communication using a model that mimics the mnemonics medical students use to remember resuscitation protocols. They call these the ABCs of communication—ask, build and check.

Important within that sequence is making sure not to ignore when a patient or family has become uncomfortable with or disconnected from the conversation. "We're teaching people that if you lose rapport, you have to cycle back and your focus has to be re-establishing that rapport before you can continue on with conveying additional information," said Dr. Macdonald.

After the brief theory-based classroom session, trainees move on to experienced-based learning sessions where they have a chance to act out difficult case scenarios with professional actors playing the roles of patients. All sessions are observed by a moderator, who can step in to assist the trainees as appropriate and give real-time feedback.



Three-dimensional transesophageal echocardiography is an emerging technique that gives surgical teams real-time feedback on the success of procedures such as valve repair. The Heart Institute is home to several of the country's leaders in 3-D TEE.

"We are very fortunate to have John Macdonald on staff," said Dr. James Robblee, Chief of Cardiac Anesthesiology at the Heart Institute. "With this new program, we have added a new strategic focus for the division. Dr. Macdonald intends to refine and scientifically validate the program with the help of other members of the staff, and there is potential to apply the training beyond intensive care communications to other areas of medicine."

The course is currently in its second year. "Feedback has been extremely positive so far," said Dr. Macdonald. "Trainees find it very practical and tell us it's actually giving them tools they can use instead of us just talking at them and theorizing." Drs. Macdonald and Hartwick have been asked to teach the course to residents in other programs, including internal medicine, palliative care, and oncology, and they hope to continue expanding the course to reach other interested trainees.

People think it's sort of a natural ability to be a good communicator, but it's really a skill—you can be taught, and you need to practice," concluded Dr. Macdonald.

MORE INFORMATION ONLINE

Links in the electronic edition at www.ottawaheart.ca/the_beat.htm

- Read more about Cardiac Anesthesiology at UOHI

Education for 24/7 Patient Care

Participants in the Cardiac Nursing Series receive specialized training in caring for patients with heart disease. Here Lee Pollington, Peggy Banning and Apryil Bay (left to right) learn about ventricular assist devices.

Nurses form the backbone of patient care at the University of Ottawa Heart Institute, seeing patients through the continuum of cardiovascular treatment from admission to treatment, recovery and the transition back to health. Many of these patients are acutely ill with complex conditions. On the frontline of care, it is often the nurse who identifies new or developing clinical issues in patients. Critical thinking and the ability to function in highly technological environments are essential skills.

Recognizing the integral role nurses play and the specialized training they require, the Heart Institute's Clinical Services division is strongly committed to nursing education and training at all career stages. This commitment has sparked the development of innovative homegrown programs that have been emulated elsewhere.

"We're trying to make our nurses the best at what they do, and we want to keep them up to date on the care they provide," said Judith Sellick, Clinical Nurse Educator in the Cardiac Surgery Intensive Care Unit. "Nurses are the ones who are there for the patients 24/7, so they have to be trained to a standard where they can recognize emergent problems and know what to do—or where to go and who to contact—to solve those problems."

Early Exposure to Cardiovascular Challenges

The Heart Institute's role in mentoring nurses begins at the undergraduate stage. Students enrolled in the Bachelor of Nursing program at the University of Ottawa and Algonquin College can choose clinical placements on the Heart Institute wards during the third and fourth years of their degrees. Placements range from two weeks of practical experience in the day-to-day challenges of cardiovascular nursing, to six-week consolidation placements for senior students. Consolidation placements are usually chosen in the areas nursing students hope to enter after graduation.

Senior nurses provide mentorship to all students participating in clinical placements in the Institute's wards, helping them integrate their academic knowledge with the skills and technical expertise that will be required in their ongoing practices. Registered nurses (RNs) enrolled in the Masters of Nursing and Nurse Practitioner programs at the University of Ottawa are also mentored by advanced practice nurses and clinical educators at the Institute.

Some newly qualified nurses who have rotated through the Institute's wards choose to return for employment after graduation. These new graduates benefit from the ongoing New Graduate Initiative, a program sponsored by the Ontario Ministry of Health and Long Term Care that provides an additional 12 to 30 weeks of mentorship by an experienced RN.

Homegrown Expertise

Even though new nurses have received a thorough formal education, they do not graduate with the extensive skill set and knowledge required to work in an intensive cardiac care environment. Like most other critical care units (CCUs) in Ontario, the Heart Institute's CCUs have had challenges in recent years recruiting enough qualified cardiac nurses. In a proactive move, Clinical Services decided to grow its own expertise.

"In 2006, we initiated an in-house education program for nurses on both the Cardiac Care Unit and Cardiac Surgery Intensive Care Unit, to take people with no critical care experience and train them up to our standards," explained Sellick. In 2007, two additional intensive care units within The Ottawa Hospital system joined the program, expanding both the faculty and the facilities available to the students. Learning tools available to trainees include a life-sized patient simulator that can produce abnormal cardiac rhythms and deteriorating vital signs and mimic respiratory emergencies.

The program comprises 20 weeks of full-time instruction. The first 12 weeks are a mix of classroom and clinical experience, with a week of class followed by a week of hands-on practice of the newly learned skills. In the last eight weeks, the nurses work one on one with a mentor in the critical care setting, with one hour of class a day to reinforce newly acquired knowledge.

"I had been a nurse for three and a half years before I applied to work in the Cardiac Surgery Intensive Care Unit and was offered participation in the nursing critical care program," said Julie Lukus, a recent graduate. "In an ICU setting, you need to be constantly on your toes, anticipate all the possible outcomes for a patient and intervene before anything happens. We re-enacted crisis scenarios in the lab, which helped ease us into the real ICU. Intensive care can be a very

(continued on page 3)

(Education for 24/7 Patient Care, continued)

intimidating nursing placement, but with the Heart Institute course, I felt prepared and eager to start my new nursing role."

In the years since the Heart Institute program started, according to Sellick, "This is the route most Canadian institutions have gone, either collaborating with a local college or doing it on their own."

Career-Long Learning

Nursing education at the Heart Institute does not stop when trainees step into their first full-time positions. The rapid innovation in modern health care technology and delivery makes continuing education a priority for the nurse educators. In-house training sessions on new equipment, "lunch and learns," all-day seminars and web-based educational materials all keep Heart Institute nurses current on changes in best practices, new technology and updates to how care is provided to patients at the Institute.

The nurse educators also present a continuing education program called the Cardiac Nursing Series, which is taught once a month from September to March every year. The five daylong courses cover specialized topics in cardiovascular medicine:

- Cardiac assessment and diagnostics
- Basic arrhythmia interpretation
- Acute coronary syndrome and 12-lead ECG interpretation
- Electrophysiology, pacemakers and defibrillators
- Heart failure, cardiac assist devices and cardiac surgery

The series has run for more than 10 years, and up to 40 per cent of participants come from outside institutions all across Ontario. The sessions have also been simultaneously broadcast to partner hospitals, such as Thunder Bay in northwestern Ontario.

Heart Institute nurses are encouraged to pursue additional professional education and certification, such as the Canadian Nursing Association's national certification program, which allows RNs to earn credentials in specialized areas, such as cardiovascular or critical care. In addition to providing an eight-part evening review class for nurses preparing to write the exam, Clinical Services has developed a set of online test preparation materials to allow nurses to study and review on their own time.

The nursing education provided by the Heart Institute no longer stops at its front doors; a regional educator is now available on staff to assist partner hospitals throughout the region and around the province. "We recognized that if we are working in concert with all of the smaller hospitals in the area, and even some of the larger ones, we need to make sure that all are rolling out best practice in cardiac care," explained Sellick. "I think that's one of the most unique things that the Heart Institute does—involving our partners directly in our patient care programs."

For example, the Institute is currently rolling out a new care protocol for heart failure and training its nurses on the new standards of treatment. "But we won't just roll it out here. It will be implemented across the region, so all the hospitals have the opportunity to care for their patients using programs based on best practice guidelines," she said.

MORE INFORMATION ONLINE

Links in the electronic edition at www.ottawaheart.ca/the_beat.htm

- See the 2010-2011 Cardiac Nursing Series schedule
- Read about Clinical Services

Training Excellent Cardiologists

Every year, up to 60 internal medicine residents apply for four available positions in the cardiology residency program at the Heart Institute, making the program one of the most competitive in Canada. The rigorous three-year program begins after a full three years of training in internal medicine, including up to six months of previous clinical cardiology experience.

The Heart Institute offers a training experience unique in Canada in that its physicians perform "pretty much all procedures in cardiology and all at the same centre," said Dr. Christopher Glover, Director of the Cardiology Residency Program. "We're a comprehensive cardiology centre. Any patient requiring more than just basic care in cardiology comes to our site, and the residents get exposed to all of that."

A group of residents at the University of Ottawa Heart Institute participate in rounds with cardiologist Dr. Benjamin Chow (right). Competition is fierce for the four cardiology residency slots available each year.

> "We develop strong mentorships with the staff, which translates into better guidance and research opportunities for us."
>
> – Dr. Nina Ghosh, Chief Resident in Cardiology, UOHI

In their three years at the Heart Institute, the residents rotate through acute cardiac care, clinical and outpatient cardiology, and pediatric cardiology, including a rotation at the Children's Hospital of Eastern Ontario (CHEO). The trainees receive instruction in a wide range of techniques, including cardiac catheterization, echocardiography, electrophysiology and pacemaker implantation, stress testing, and nuclear medicine.

"Compared to other cardiology residency programs, we manage sicker patients in the critical care unit, and we get to see a wide variety of cases," commented Dr. Nina Ghosh, currently the Chief Resident in Cardiology. "And since all the care is delivered in one place, we develop strong mentorships with the staff, which translates into better guidance and research opportunities for us."

The residents are provided with laboratory rotations throughout all three years of the program, and they perform at least one of their own basic or clinical research projects under the mentorship of Heart Institute scientists. In the third year of the program, residents run a cardiology clinic for the entire year, attending one day each week, with oversight from a faculty cardiologist.

Unlike the recent changes in undergraduate medical education (see "In Conversation," p. 4), the format of residency training has remained relatively stable over the years. "But one thing that's happened over the last 10 to 20 years," explained Dr. Glover, "is that there has been a recognition in all of medicine that being a medical expert is important, but there are also so many other aspects of being a physician that are important—like being a good communicator and a good manager—and the Royal College [of Physicians and Surgeons of Canada] wants us to emphasize those aspects more. So they have quantified what they expect a little better, and we've adapted that into our program."

The Heart Institute recently received its re-accreditation from the Royal College for a full six years. (Institutions not meeting all of the College's qualifications may only receive two- or four-year conditional accreditation.) "They usually identify where a residency program needs to improve, and this time there was nothing, no weakness, identified in the program," said Dr. Glover.

"That being said, I think we always need to be vigilant because there are so many demands on the residents—they have to study a lot, they have to do their research, they have to work a lot—they have a lot of competing elements to their training. My role is to make sure all three are kept in their proper perspective," he continued. "We want them to be well-rounded, but ultimately, we want to make sure that they're excellent cardiologists so that wherever they go, they're going to deliver excellent care to patients. That's really the main goal of our program."

Spreading the Word about Clinical Engineering

While Timothy Zakutney has been busy with educational initiatives as Manager of Biomedical Engineering, he makes clear that it is the next generation of clinical engineers that the University of Ottawa Heart Institute is training.

What is the difference between a clinical engineer and a biomedical engineer? According to Zakutney, biomedical engineers develop technologies and devices for use in a medical context. Clinical engineers put those technologies and devices to work. Their focus is the application of those products, from the point at which a need is expressed, right through a piece of equipment's life cycle until it is disposed of or becomes obsolete.

Clinical engineers plan for technology. They procure the equipment, design the space in which it will be used—such as an operating room or electrophysiology lab, arrange and provide training for staff, monitor its use and rectify problems as they occur. This behind-the-scenes expertise is a critical aspect of the technology-dependent environment of cardiovascular medicine.

"A huge portion of our responsibility relates to patient and staff safety," Zakutney said. "There's a vast amount of technology that goes into an operating room. We have to make sure each piece is fully integrated and ensure that people know how to use it. It's more than just filling out a purchase order and buying equipment."

The Heart Institute's Biomedical Engineering program is widely regarded. Its innovative work in battery management has garnered a good deal of attention on both sides of the border and won Zakutney the Outstanding Canadian Biomedical Engineer of the Year award.

An increasing portion of Zakutney's responsibility revolves around education. For many years, Biomedical Engineering has attracted students to the field by hosting them at the Heart Institute, including students from high school, university engineering programs and college technology programs. This year, for the first time, the group is hosting an intern courtesy of a new endowment from the Leacross Foundation.

(continued on page 4)

(Spreading the Word about Clinical Engineering, continued)

The Leacross endowment originated from a compelling tour of Heart Institute facilities that Zakutney conducted for Roslyn Bern, President of the Leacross Foundation. The Foundation has a particular interest in supporting women in engineering and technology, and Bern was impressed by what she saw. As a result, the Heart Institute received a $300,000 endowment to hire a female student in engineering or technology studies each summer.

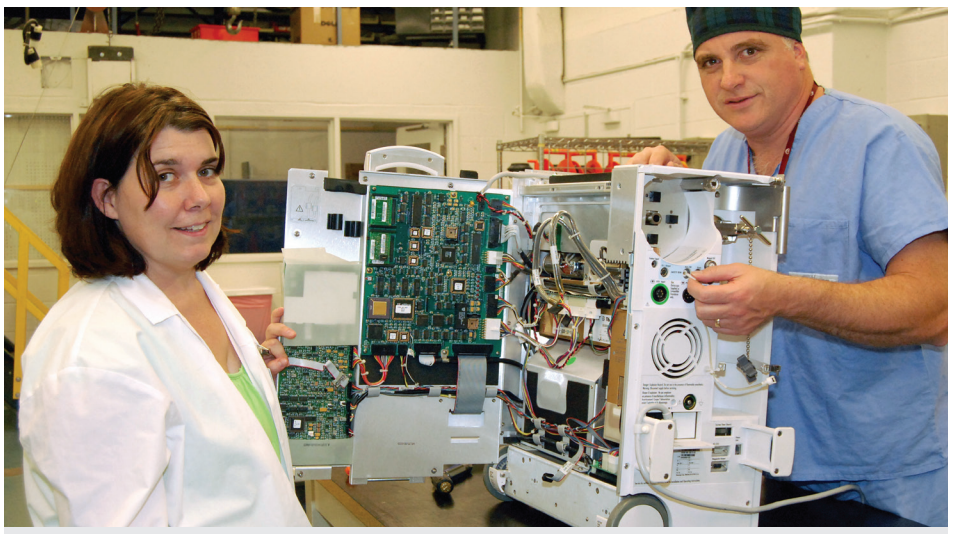
"Roslyn recognized the vital role we play and valued it," said Zakutney. As a result of her philanthropy, Rachel Zhang, a master's student in clinical engineering from Zakutney's alma mater, the University of Toronto, spent her summer learning about application of her field in a hospital context.

A nice thing about the endowment, said Zakutney, is that it doesn't require that interns come from a specific school. So, while this year he approached the University of Toronto, in future years, he'll go to other universities and colleges, to "spread the wealth," as he put it.

For students, internships are absolutely essential. "We're problem solvers," Zakutney explained. "The only way you can get a sense of the problem is to be in the middle of it."

But while there's nothing like real-world experience, Zakutney is also venturing into the classroom, teaching a fourth-year course in clinical engineering for the Department of Systems and Computer Engineering at Carleton University. It has been a rewarding experience exposing students to an area of engineering they've not previously encountered and talking to them about issues such as patient safety. His efforts are already having an impact, with one student going on to the University of Toronto master's program. "If you can connect with one student and convert them, it's a great thing," he said.

Zakutney feels the rewards of teaching outweigh the daunting demands of lecture preparation and plans to be back for more in January. "It is my desire to help establish a graduate program in clinical engineering at Carleton or the University of Ottawa. Right now, there are only a handful of such programs in Canada," said Zakutney. Teaching a course has gotten his foot in the door, and he intends to make the most of his foothold.



Technologists Mark Cleland and Jolene Robbins examine a malfunctioning intra-aortic balloon pump, a cardiac assist device. Biomedical Engineering plans for, implements and maintains the vast array of clinical technology at the Heart Institute and is working to attract more women to the field of clinical engineering.

MORE INFORMATION ONLINE

Links in the electronic edition at www.ottawaheart.ca/the_beat.htm

- Read about the Biomedical Engineering program

In Conversation

Dr. Michael Froeschl: A Passion for Education

Dr. Michael Froeschl joined the University of Ottawa Heart Institute in 2006 as a cardiologist with practice interests in both general and critical care as well as interventional cardiology. In addition to his clinical duties, Dr. Froeschl was recruited to assume management of the cardiology component of the University of Ottawa Medical School curriculum. Heart Institute physicians are generally cross-appointed as University faculty.

The Beat: What aspects of the undergraduate medical curriculum are you responsible for?

Dr. Froeschl: I'm responsible for the cardiology component of the first-year undergraduate medical curriculum. It's all about learning the basics. But the division between learning the basics and learning the practice is much more graduated than it used to be. There's now clinical exposure in the first two years, and there's a back-to-basics portion of the fourth year. There's also a three-week transition period between the predominantly classroom and predominantly clinical periods, and I have a role in the cardiology training there as well.

I'd really like to create a unified four-year cardiology curriculum for the undergraduate students, to have topics revisited throughout their training, but at a more advanced stage and at more depth—an organized curriculum that builds on what came before. The only way to do that is to have one person responsible for all of the components.

The Beat: Has the undergraduate curriculum changed since you assumed oversight?

Dr. Froeschl: When I came into my position, the medical school was in the process of completely changing the content, so I was able to come in at the ground level and help shape the new curriculum. The emphasis is now very much on outcomes: You begin with the attributes that you think make a good physician, and then you design tests that you believe will ensure that those outcomes have been achieved. Once you've designed the test, you look at what you need to teach to make sure they pass those tests.

Now when we create a teaching session, a lecture, for example, we generate objectives—clearly stated and ideally observable—that students are given ahead of time so they know exactly what they're expected to take away from that one-hour session. And they know that only those objectives can be tested. It's a practical recognition that even though they love the subject matter and are passionate about learning to be great doctors, there's a limitless amount of material that could be taught and a relatively limited amount of time in which to teach it. I think this system really helps both the students and the teachers focus.

The Beat: The education aspects of your appointment take up a large percentage of your time. Had you always wanted to be a teacher?

Dr. Froeschl: In high school, I wanted to be a teacher—I had great high school teachers—but then I went to university and became enamoured with the sciences, and at that point decided, well, I'll give up my dream of becoming a teacher since I really want to be a doctor. Then during medical school I realized that the people lecturing us weren't teachers but were physicians who were also teaching. That's when I realized that you could do both.

The Beat: And now you're pursuing additional education for yourself in the area of medical teaching?

Dr. Froeschl: I am—I'm just completing a master's in medical education, through Maastricht University in the Netherlands. The degree itself is fairly new—it's an acknowledgment that medicine has been basically like an apprenticeship in that you were taught by people who could do, but who had not necessarily been trained to teach. We're learning how the mind works, how adult students learn—which is quite different from how children learn—how to organize curricula, those types of things. We've also delved into clinical reasoning, which is a hot topic these days—how to teach people to think rationally about a patient. Basically, I want to use what I learn in order to teach cardiology better.

The Beat: What is your impression of the overall teaching culture here at the Heart Institute?

Dr. Froeschl: The Institute was originally built to serve the clinical needs of the patients of the Champlain region, but at the same time, the people who founded this place—Dr. Keon on the surgical side and Dr. Beanlands on the cardiology side—always placed a strong emphasis on education. Though the Institute has grown, that culture remains today. Education is really emphasized, and people here want to teach—they volunteer to do it, they're happy to do it and they're good at doing it. I think that culture of being very passionate about teaching and doing it well sets this place apart."

MORE INFORMATION ONLINE

Links in the electronic edition at www.ottawaheart.ca/the_beat.htm

- Read more about Cardiology at UOHI