

The Future of Clinician-Scientists in Canada

• Matthew W.C. Chan, Hon BSc, MSc •

© J Can Dent Assoc 2004; 70(6):379-81

Scientific research is an integral part of dentistry, bringing us new knowledge and different approaches to providing better patient care. Clinicians — our front-line health care providers — are in a unique position to raise novel scientific questions from clinical cases and to bring solutions from benchside to chairside. Yet the shortage of clinician-scientists has been a common theme in our Canadian dental schools in recent years.

With the greying of faculty members, the challenge to sustain the existing level of clinician-scientists becomes even more difficult. How can we alleviate this growing concern? The answer seems to lie with the ability of universities to attract dental students into careers in academia — and to prepare them for such careers.

Through my own experience and discussions with my fellow-students, there appear to be some common issues that deter students from becoming clinician-scientists. First, the financial burden of today's dental students is a lot more than that of graduates from a decade ago. With rising tuition fees (which have almost doubled in the past 5 years), the average student will have a debt of about \$100,000 or more by the time he or she graduates. The financial incentives of practising dentistry outweigh those of an academic career, especially in the early years following graduation when students are trying to repay their loans. Once students leave an academic institution, it becomes more difficult for them to return.^{1,2}

Further, the average age of graduating students is late 20s, when many are trying to start families. They believe the long hours required to establish a research program would not be compatible with family life. This perception is related to another problem: the lack of role models in our schools to mentor students into becoming clinician-scientists. The DDS/PhD who practises dentistry and is actively engaged in research is increasingly rare.

Although the future looks bleak for our dental faculties, there are ways in which this crisis can be overcome. In the U.S., the National Institutes of Health (NIH) offers dental scientist fellowships that provide tuition support for dental

students if they commit to a research career.³ Should the Canadian Institutes of Health Research (CIHR) follow suit, this would help Canadian dental students become clinician-scientists by assisting them with their financial burden. This is not a novel idea in Canada. The Canadian Armed Forces have a Dental Officer Training Plan that helps subsidize dental education, in exchange for a period of service upon graduation.⁴ The military usually has more applications than positions available.

Sometimes, monetary rewards are not enough to persuade students to select a career in academic dentistry. A stimulating intellectual environment is also an important driving force in nurturing students to become clinician-scientists. One approach is to expose students to scientific research in the early stages of their education. I spent the summer break during my undergraduate years working in various research laboratories and received MSc training before my studies in dentistry. This experience gave me the opportunity to develop relationships with world-renowned scientists, while learning from their experiences in establishing my own research career.

I believe that if students have the chance to engage in research in their undergraduate studies or early years of dental school under the appropriate mentorship, they will be more inclined to pursue a career in academia. Dental students in the preclinical years (first and second year) have more flexibility in their schedules than those in later years due to the lack of patient-related responsibilities. If Canadian dental schools can integrate research training as a mandatory or elective component of their curricula during the preclinical years, it might give students the drive and motivation to incorporate research into their future careers.

Current dental students have an opportunity to become involved in research training unavailable to their predecessors. In spring 2001, CIHR and its partners created the Strategic Training Initiatives in Health Research (STIHR) program. Its goal was to provide funding for health research training in Canada. Since its inception, CIHR has funded

86 STIHRs, of which 2 are directly related to the field of dentistry: Cell Signaling in Mucosal Inflammation and Pain⁵ (director: Dr. Richard Ellen, University of Toronto) and The Network for Oral Research Training and Health (NORTH)⁶ (co-directors: Dr. Graeme Hunter, University of Western Ontario, and Dr. Paul Santerre, University of Toronto).

Of the 86 STIHRs, NORTH is the only one created exclusively for undergraduate students. Its mandate is to provide dental students across Canada with the opportunity to work with researchers in a variety of fields during their summer break, regardless of where they attend dental school. Participating students present their research work at an annual electronic conference on the NORTH Web site. NORTH is unique in that it allows students to be mentored by dental researchers while networking with their colleagues from other schools.

I study dentistry at the University of Western Ontario. Last summer, I had the privilege of travelling to the University of Toronto to work with Dr. Christopher McCulloch on the mechanisms involved in wound healing. I also collaborated with graduate students, fellows and technicians who will be invaluable resources for advice and

expertise in my future research endeavours. Further, I had the opportunity to present my research work at the recent conference of the International Association for Dental Research, where I shared my findings and learned from many research experts.

Participating in NORTH has exposed me to many different dental research fields, enabling me to make a more informed choice when I apply to dental specialty programs and select an area of research to pursue.

In the first annual workshop (held in December 2003) to evaluate the progress of the STIHR-funded training programs, several topics were discussed regarding the state of clinician-scientists in Canada. The challenges facing the recruitment and retention of clinician-scientists in many institutions are common: remuneration, increased student debt, students' exposure to research, and lack of role models. However, if the momentum continues and more effort is made to convince students that becoming clinician-scientists is a financially feasible and exciting career path to follow, more students will consider academic dentistry as a viable option.

In the present NORTH application cycle, there were 132 applications for some 40 positions. During the STIHR

What's New in Dental R&D Oral Research Goes Due NORTH



The Network for Oral Research Training and Health (NORTH) has as its main objectives to increase the quantity and quality of oral health research, and to increase the number of Canadian dental graduates who choose careers in academic dentistry.

NORTH is directed by Dr. Graeme Hunter, a professor of dentistry at the University of Western Ontario in London, and Dr. Paul Santerre, a professor of dentistry at the University of Toronto.

"It's becoming more difficult each year to attract new dental school graduates into academic careers, as opposed to private practice," observes Dr. Hunter. "NORTH is an attempt to deal with the problem, namely by giving dental students exposure to the research skills that they would need to enter upon an academic career. This is a training program, and the idea is for these students to be exposed to research, to hopefully be excited by research, but also to learn skills and research methodology. A group of mentors, who are

faculty members at Canadian dental schools, have been approved to supervise NORTH students. Each student is assigned to a project submitted by one of these mentors and will work very closely with that mentor through the period of NORTH employment. The project supervisors are among the top oral health researchers in Canada by all objective measures of merit. The students who go to these labs are getting a tremendous opportunity."

NORTH provides projects across a broad spectrum of disciplines which transcend the 4 pillars of the Canadian Institutes of Health Research (CIHR): biomedical research (e.g. microbiology, oral cancer, biomaterials); clinical research (e.g. dental implants, facial pain, periodontal reconstruction); health services (e.g. pain and anxiety management, ergonomics, radiology); and population health (e.g. dental health of aboriginal and low-income groups, ethics, fluoridation).

NORTH receives financial support from the CIHR's Institute for Musculoskeletal Health and Arthritis. "Funding for NORTH was approved in February 2002 and we supported our first group of students in the

workshop, CIHR president Dr. Alan Bernstein stressed the importance of transdisciplinary health research training in this new age. Oral health is a vital part of systemic health. Leaders of the oral health care sector are responsible for developing innovative research initiatives, thereby maintaining Canada at the forefront of health care. ❖

Acknowledgement: The author would like to thank Dr. Graeme Hunter for his comments on this manuscript.



Mr. Chan is a second-year dental student at the University of Western Ontario, London, Ontario.

Correspondence to: Mr. Matthew W.C. Chan, The University of Western Ontario, Faculty of Medicine and Dentistry, Room 0077, Dental Sciences Building, London, ON N6A 5C1. E-mail: matthew.chan@utoronto.ca.

The views expressed are those of the author and do not necessarily reflect the opinions or official policies of the Canadian Dental Association.

References

1. Douglass GD. Failure to attract and retain clinician/scientist faculty puts our profession at risk. [Letter to editor] *J Dent Res* 2000; 79(1):6.
2. Krebsbach PH, Ignelzi MA Jr. Failure to attract and retain clinician/scientist faculty puts our profession at risk. *J Dent Res* 1999; 78(10):1576–8.
3. National Institute of Dental and Craniofacial Research, National Institutes of Health. Loan repayment programs. Available from: URL: <http://www.lrp.nih.gov/about/index.htm>.
4. Dental Officer Training Plan. Canadian Forces Recruiting Centre. Available from: URL: http://www.recruiting.forces.gc.ca/html/careers/career_advantage/education.html#dotp.
5. Cell Signaling in Mucosal Inflammation & Pain. Available from: URL: <http://www.cellsignals.ca>.
6. The Network for Oral Research Training and Health. Available from: URL: <http://www.northdentalresearch.ca>.

summer of 2002,” Dr. Hunter recalls. “We now have 2 summer terms under our belt, each with about 35 students receiving support for their research efforts. These are students from each of the 10 Canadian dental schools. This year, we expect to support 40 students.”

A unique feature of NORTH is its electronic poster conference. “We figured that, because we are a network of institutions that reach all the way from Halifax to Vancouver, we would be unable to hold an annual retreat where we would physically assemble and look at our research findings, so we decided to hold a virtual conference instead,” Dr. Hunter explains. “We set up a Web site that has the advanced Internet technology necessary for hosting such an event. The electronic poster conference is held for 3 weeks in February or March. The students submit their research findings in the form of a PowerPoint presentation. This is then posted to the NORTH Web site and anyone who wants to can view the presentation online and submit questions to the presenter on an electronic bulletin board.”

Students can apply for NORTH projects in dental schools anywhere in Canada. This is another unique

element of the program and one that students seem really excited about, according to Dr. Hunter.

NORTH works in partnership with CDA. “We received a strong letter of support from CDA when we submitted our original application,” Dr. Hunter said. “We would like to involve CDA and our other partners much more closely in the future. CDA has a critical role to play here, because we need to get the word out to the profession that there is a problem with academic hiring at dental schools. We really need CDA’s support to ensure that students are going to consider academic careers. I hope that NORTH is part of an overall solution to the problem.”

CDA believes that this training program will lead to a rapid improvement in applied oral health research, and its management team will work with the organizers to support the program, publicize it and promote the application of its research.

To find out more about NORTH, visit www.northdentalresearch.ca.

— Harvey Chartrand, CDA