

Education and Training in Canada - a personal view

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Abstract

Canadian medical schools are under stress. Following health care re-structuring, the traditional learning environment, the “teaching hospital” no longer provides an adequate setting in which students can develop clinical skills and learn about the continuum of care. New care models are being developed, requiring special skills for work in collaborative teams. Current medical school enrolment will not meet Canada’s future physician needs which are being re-defined by changes in both societal needs and newer physicians’ practice patterns. Few Canadian educational programs have begun to address the need for more generalist and more rurally based physicians. New approaches to learning are required. Specific time-based education must be re-examined. The present balkanization of curriculum must be changed to reflect a learning continuum and to enable the acquisition of new knowledge and skills over a practice lifetime. Clinical learning environments no longer can be only the domain of teaching hospitals but must include all practice environments. Canada’s medical education leadership is concentrated in only 17 faculties and two colleges: we therefore have an advantage when working together for change.

Introduction and Background – the Environment and the Leaders:

Canada is a loose federation (confederation) of ten provinces and three territories. Constitutionally, health and education are the jurisdictional responsibility of the provinces. The federal government has defined its role through negotiation and legislation supported by its ability to tax and to transfer money to the provinces in exchange for co-funded health care programs, which meet an agreed-upon standard. Over time Canadian society has demanded increasing public funding for such services and they have expanded, shaped by key legislation: the 1957 Hospital Insurance and Diagnostic Services Act creating the legal foundation to alleviate the cost of in-hospital care; the 1966 Medical Care Act providing insurable doctors’ services (Medicare); the

1984 Canada Health Act establishing criteria and conditions for a range of insured services including “extended health care services”. To receive federal transfers the provinces ensure that programs providing medically necessary hospital and physician/surgical services are comprehensive, universal, accessible, portable, and provided through a publicly administered system. Medicare and these principles are embedded in our national value system¹.

Canadian medical education is provided by 16, soon to be 17, schools in seven provinces. These faculties of medicine are dependent on the health service system for the delivery of their educational programs. Clinical faculty are expected to be role models of the art and science of medicine and thus must maintain an active practice. The learning environment has always extended beyond the classroom to include the triad of patient, student and clinician-teacher, and the hospital environment has been our key practice/learning environment. Only Canada’s newest medical school, the Northern Ontario Medical School, which begins enrolling students in 2005, is developing its clinical curriculum and learning experiences based on patient care outside the tertiary care hospital.

Two evolutionary forces have affected the classic in-hospital clinical learning environment, the “clinical teaching unit”, in the last fifteen years. One has been the massive restructuring of Canada’s health care system. The other has been faculties’ need to reconsider their educational processes in order to respond to burgeoning medical knowledge and associated societal expectations.

Canadian health reform has been labelled “incrementalism under fiscal distress”². From 1989 to 1997 each Canadian province, with the exception of Ontario, underwent processes to regionalize health care services. In each case the intent was to better align the needs of the population with available resources, integrate services across the spectrum of care, increase the quality of care, improve health promotion and disease prevention, and increase accountability, with the expectation that cost efficiencies would result. Some institutions were closed, others were amalgamated, and various services including acute secondary and tertiary care were integrated with some community-based

and long-term care services. Ontario underwent restructuring of some of its secondary and tertiary care services but it continues to have independent hospital boards.

Superimposed on all the re-structuring was fiscal instability due to funding reductions through the mid-1990s. Lewis and Kouri³ have written an excellent review of the Canada-wide re-structuring. They conclude that despite a 42 per cent increase in funding between 1997 and 2003, regionalization remains primarily a structural change³ without resolving appropriate levels of funding, levels of accountability, best practices or health human resource forecasting.

However, regionalized governance and the restructuring of health care delivery have brought substantial changes to the practice and delivery of medicine and, therefore, to our most important classroom, the hospital. Throughout the country, in-hospital beds have been reduced; hospital stays have been shortened, leaving more acutely ill and fewer convalescing patients in hospital. Procedures and medical services delivered through ambulatory care have increased dramatically; procedures such as cataract surgery and complex invasive radiology are done through outpatient services. Pre-operative clinics have replaced on-ward assessments; same-day surgery results in the patient presenting to many hospital-based staff and students only after the procedure is over; some patients return home without entering the hospital system.

These changes to the teaching hospital - traditionally the focus of clinical teaching, the primary site for clinical faculty, the support for clinical research and research institutes - have had a similarly substantial impact on clinical learning. The large “clinical teaching unit” of the 1960s and 1970s was a ward of up to 50 patients, half of them convalescing from medical or surgical invention and many of them willing to spend an afternoon with a student learner. The postgraduate student (hospital resident) would care for the patient through much of the disease process and experience the satisfaction of seeing an almost healthy person walk out of hospital. The patient of 2004 is likely to go home after a few days: only those with the most complicated speciality illnesses, often with multi-system involvement, linger in the modern hospital. Ambulatory care now is the venue for many sub-specialty programs such as dialysis, endocrine or infectious diseases, while others,

such as HIV care, have been moved to multi-disciplinary clinics. The hospital ward is not an environment in which the naïve student can hone her history-taking and physical examination skills. It is not an environment in which the history of disease, investigation and therapy can be followed and learned. Nor is it an environment that engenders in students either a sense of patients as individuals or the personal gratification that comes from following the patient through care. While there is no doubt that the student still can observe and learn good clinical care and can achieve specific competencies, restructuring of tertiary care hospitals makes it impossible for educational planners to ensure that students experience the continuum of care that was available 20 years ago. Medical schools must change their traditional in-hospital based undergraduate/postgraduate learning experience to accommodate the new service delivery models of care. For this we must look to our educational leaders.

Leading to Change

Two documents, the US GPEP report, *Educating Physicians for the 21st Century* and, in Canada, *Educating Future Physicians for Ontario*, spawned major changes in curriculum development in North America. The recognition that medical students are adult learners, the rapid accumulation of new knowledge, and our inability to force any more into the time-limited curriculum demanded new approaches to learning. New Mexico and McMaster led the development of problem-based learning. Modifications of this approach and case-based learning applied in an integrated curriculum became a standard for medical education. Other commissions and reports have guided Canadian curriculum development. In Canadian postgraduate education, the College of Family Medicine report on the four principles of family medicine⁴ and the Royal College of Physicians and Surgeons' report, *Can Meds 2000*⁵, identifying the seven roles of the specialist, have changed educational objectives in family medicine and other specialty education - and these principles now are influencing undergraduate education too. Work by Richard and Sylvia Cruess and others⁶ has helped to define the appropriate attitudes and behaviours of the professional and methods of assessment. Attitudinal competencies have always been considered the most difficult to evaluate. However, students identified as having

attitudinal problems are more likely to face disciplinary action during their first ten years in practice. Much work has been done on developing codes of behaviour, peer assessment and mechanisms for global assessments which evaluate attitude, although these have yet to be employed effectively at all levels of medical education.

Despite major health care re-structuring, Canada maintains an international standard of medical education from undergraduate through postgraduate and continuing professional development. How do we achieve this when university, institutional, community health care, physician and most other health professional funding varies from province to province to territory? National professional organizations have played the pivotal role in sustaining a uniform approach to medical education in Canada. They have created credibility among practitioners, educators, politicians, regulatory/ licensing authorities and most importantly with the public. These are the bodies that can effect change.

The Association of Canadian Medical Colleges manages the only medical school undergraduate accrediting process in Canada. Through a joint process with the United States every graduate of a Canadian and US LCME/CACMS accredited medical school is recognized in both countries. There are only two national colleges responsible for overseeing accreditation of programs and the credentialing and examination of postgraduate students: the College of Family Physicians of Canada (CFPC celebrating its 50th anniversary this year) and the Royal College of Physicians and Surgeons of Canada (RCPSC marking its 75th anniversary this year) for all specialties and sub-specialty programs. Canada also has a national examination, which evaluates all graduating students, developed by The Medical Council of Canada, established for that purpose in 1913. The MCC Qualifying Examination (part 1) evaluates medical, organizational, legal and ethical knowledge at the time of graduation and the MCC QE (part 2) evaluates clinical skills during the early part of postgraduate education. Provincial and territorial licensing authorities are defined as self-regulating under provincial legislation. While each reserves the right to define their own licensure requirements, all recognize graduates of the Canadian and US medical schools and all recognize certificants of the two Canadian Colleges. Most also require the MCC evaluation or its equivalent. The

licensing authorities communicate and collaborate on a national level through The Federation of Medical Regulatory Authorities of Canada (FMRAC).

These national bodies (ACMC, CFPC, RCPSC and MCC) and the licensing authorities monitor and approve objectives and standards for Canadian medical education and are responsible for examination and accreditation. They therefore have the ability to lead the iterative process between educators, regulators, the system/profession and society that must exist if change is to occur.

Re-imagining Clinical Education

Traditional approaches clearly no longer can be sustained. Changes in clinical learning already are underway in Canada, driven partly by the pressures of health care reform with its downsizing and changes in service delivery, and partly by changing pedagogy.

Clinical learning must follow clinical practice: developing new clinical learning environments is necessary to enable the student to follow their patient through the continuum of care. Almost all postgraduate educational programs achieve this by having their residents participate in clinics over time. Family Medicine programs have been leaders in this approach, offering complete programs outside the university centre. Undergraduate medical programs have had more difficulty adapting, given the traditional in-hospital focus. All schools now have ambulatory components within their clinical clerkships though most clerkships in traditional specialties retain the ward as their primary learning environment. Many Canadian schools are turning to community and regional health boards to place their students in primary and secondary care environments to provide better opportunities for clinical follow-up. However, the majority of clinical professors still are in the urban centers, attached to the major academic health care organizations which are usually tertiary or quaternary care institutions as well as centers for clinical research, serving faculty who wish to pursue this academic track.

Faculties face complex demands which must be addressed simultaneously: development of new clinical learning experiences which permit our students to move through the patient care continuum; finding ways to sustain faculty members' teaching and research roles; addressing new or still unresolved societal expectations for health care provision. To do so successfully, we must challenge some of our current assumptions and practices.

Training and Time Frame

Should we re-think the length of training for physicians? Is this even the right language for today's learning environment? "Training" implies a fixed set of terminal competencies, thus a time-based curriculum, a right and finite education period – yet we also espouse our professional responsibility to be "life-long learners". Our language needs to change: we no longer "train", we learn; the time-based curriculum becomes a "learning continuum" that extends through our practice life. Such a paradigm shift challenges our organizational structures at both undergraduate and postgraduate levels as well as in continuing medical education. Defining sub-specialty practices is perhaps the best example of trying to fix a time frame around what is really a constantly evolving set of special competencies expanding from a broader generalist base. The "right" length is impossible to define. It also is a completely unhelpful concept to physicians in practice: these individuals require entirely different mechanisms than specialty training through which to acquire new knowledge and skills within their practice lives. Our current efforts to specify a limited time for learning contribute to the balkanization of the educational experience.

The joint Canadian/US accreditation bodies (CACMS/LCME) require at least 130 weeks of instruction time⁷ in the undergraduate curriculum. No clear rationale or annotation supports this time frame and it provides little flexibility for faculties or students. In Canada, the University of Calgary and McMaster University offer a three-year MD program. It has been difficult for them to meet the 130-week standard. However, their students perform nationally (Medical Council examinations and residency matching results) in ways comparable to traditional four-year curriculum schools.

The remaining accreditation standards⁷ require faculties to have a clear mission and vision driving educational objectives; an integrated, progressive learning process with clearly defined knowledge, skills and non-cognitive elements; a scholarly and inquisitive environment. The learning environment is intended to promote and model self-directed life-long learning. Other elements of the accreditation process concentrate on ensuring that the appropriate organization and faculty are in place and that there are internal processes for monitoring student progress and institutional effectiveness. Accreditation informs the public that U.S. and Canadian medical schools have met their standards.

Undergraduate medical accreditation standards require that faculties of medicine have effective means of assessing and promoting students and of identifying those who require longer learning periods. Faculty are permitted to assess students in difficulty, to determine and provide remedial study, usually for periods beyond the 130 weeks. Yet these same faculty members are not permitted to assess and promote students who are progressing more rapidly. Accreditation is only one component of the oversight system. Canada has proven, reliable national examinations of knowledge and clinical skills, the MCC Part I and Part II. These currently are administered only after the prescribed period of instruction. If, instead, they could be administered when faculties consider students prepared, some students undoubtedly would progress more rapidly. The length of training thus could be more flexible and some individuals would enter the workforce sooner.

Postgraduate education traditionally has been separated from undergraduate education and originally was based and managed in hospitals. Only after national consensus was reached in 1965, was the educational content, management of the programs and responsibility for the quality of postgraduate education assigned to universities⁸. In 1970, the Royal College of Physicians and Surgeons (RCPSC) determined that all postgraduate specialty educational programs would be the responsibility of faculties of medicine and formalized its accreditation process for specialty and sub-specialty programs. Twenty years later in 1991, the rotating internship was abolished: Family Medicine residency became the only pathway for family practice licensure in all provinces for all Canadian

graduates. The RCPSC traditionally had used the rotating internship as a preparatory process for some specialties: now it simply added a year to their programs' specialty requirements. The unfortunate result has been that the length of postgraduate education in Canada was decided arbitrarily by this historical precedent rather than by any analysis of educational objectives or review of actual program pedagogical need. Such a review is necessary now.

As new knowledge has been introduced to medical practice, sub-specialty programs have proliferated in Canada and the U.S. Traditionally, in Canada, a sub-specialty is created when colleagues convince their peers in one of the two colleges that a body of knowledge, skills and technology is cohesive and large enough to be recognized in some stand-alone form. The groups usually form societies of interest and proceed to lobby one or both of the colleges for recognition. Canada is unique in having only two certifying colleges. This attests to their political ability to manage the needs of their constituents. Nonetheless, there is always the possibility that a specialty group will separate into an independent board if one or the other college refuses to recognize a particular expertise. This tension makes it difficult for the colleges to control the proliferation of specialty groups and thus the length of education. This is not useful in today's climate. Chan⁹ has shown unequivocally that lengthening residency education in 1991 has been a major factor in the decreased physician supply in 2003. The continued lengthening of postgraduate education through a proliferation of sub-specialty programs in both Colleges will further delay entry of physicians into the workforce.

The only solution is to shift the learning of newer competencies out of the postgraduate system. How might we do this? What are the challenges? Can we be sure of the competence of new practitioners who have had shorter training periods?

Canadian family medicine residency programs provide an instructive example of both the viability of shorter training and the pressures surrounding such a proposal to change the postgraduate system. Family Medicine programs are among the shortest educational programs, with only two years of formal clinical learning, yet their effectiveness has been

demonstrated. However, family medicine residents have been reported as perceiving a lack of readiness for practice after two years, even though they meet College standards and are recognized internationally and nationally as effective physicians. One response to these concerns has been a debate about extending the basic educational program to three years. Some argue that this would allow integration of the special needs of rural and remote practice, urban poor and city centre practice. However, there are programs that accomplish some of these objectives without extending the formal education period. The Northern Family Medicine program¹⁰ in Memorial University's family medicine residency permits nine months of the second year to be taken in their northern family medicine unit in Goose Bay, Labrador. Residents learn the special needs and the cultural sensitivities of providing health care to northern communities. All Canadian Universities offer their family medicine residents opportunities to learn and to practice in remote and rural sites and many have developed complete residencies outside the university center.

In fact, a third year already has been added by the CFPC. All university Family Medicine departments now offer an educational year in at least two of the following: emergency medicine, care of the elderly, sports medicine, palliative care and enhanced skills in some specialty areas. Unfortunately the evidence to date shows that, in emergency medicine at least, an additional year creates a specialized practitioner who no longer provides family medicine care.

Students' desire to specialize is evident from their choices in the national matching program for residencies. Family medicine and some of the general specialty programs have become less popular over the last five years¹¹. The not-so-subliminal message is that students see specialization as providing the practitioner with a better income and often more control over his or her life.

Sub-specialty expertise - residency education or life-long learning?

The concept of life-long learning has been excluded from the debate about identifying new sub-specialties and length of training. Yet it offers another approach to developing

special competencies without adding specific time periods to residency. Gaining new knowledge and skills during our practice continuum has been part of every senior faculty member's professional development - including those university leaders who often drive the development of new sub-specialty certification processes. This learning comes not from formal residency programs but from self-study and peer-supervised programs incorporated into their practice. My own knowledge and skills in managing AIDS and HIV started in 1984, ten years after entering academic consulting practice. Perhaps, then, the debate should change to one about defining the processes for acquiring specific competencies during practice. Specific objective assessment could be determined as people move along the generalist – specialist continuum. Evaluation and recognition of special competencies would continue to be through peer assessment evaluated by each college and the regulatory authorities. Such a system requires the development of professional development educational programs that accommodate active practitioners. This paradigm would mean that the newly minted specialty certificate holder would enter practice, then acquire specific sub-specialty competencies as his or her job requires, during practice.

The two colleges (CFPC and RCPSC) accredit all postgraduate programs, credential and examine all candidates for certification. They also monitor the maintenance of competence among their fellows. They therefore could shift acknowledgement of some new competencies out of the traditional postgraduate residency and into practice environments as part of peer-supported continuing professional development. Such a supportive environment would also reduce anxieties of new physicians who currently are expected to perform with exactly the same level of skill, knowledge and ability as colleagues 10 to 20 years their senior.

If we are to change our way of thinking about length of training, there must be more flexibility in undergraduate learning; postgraduate education has to stop the proliferation of sub-specialty “blocks” and provide continuing skill development during the life of the active practitioner.

New Forces Shaping Curricula – Health Workforce Needs and Social Accountability

The medical education system must find ways to accommodate the significant changes in health care delivery and to integrate rapidly evolving medical knowledge and new approaches to disease management while it also meets society's increasing need for service. That societal role has been the subject of Canadian medical schools' recent work with their partners in government, in the two Colleges and other national organizations, through the sponsorship of Health Canada. The resulting report, "Social Accountability: A Vision for Canadian Medical Schools"¹², builds on the WHO definition, laying out a set of principles that includes not only the responsibilities of faculty and students but also the need to involve the community, to have formal mechanisms to assess and respond to community needs, to develop effective partnerships with organizations, policy makers and governments and to provide leadership in responding to public needs.

All Canadian schools have increased enrolment to increase the supply of physicians and to make the country less dependent on internationally educated physicians. However, the Canadian Medical Association has presented compelling data that, despite the 30% increase since 1998, an additional 500 medical student enrolments are required if Canada is to meet 80% of the future physician need by 2015¹³. Multiple factors other than the aging physician workforce are affecting our need for more physicians. Physicians entering the workforce have changed their work habits and are looking for a better balance between professional and private life. The average time spent in the practice of medicine has decreased from greater than 55 hours per week with many physicians working more than 60 hours per week in 1985 to less than 50 hours per week in 2000 and many work 45 hours or less¹⁴. Women now comprise more than 50% of the first year enrolments in medical school¹⁵. Women also report, on average, about eight hours less medical practice per week than their male colleagues. The distribution of the physician workforce remains a challenge. Shortages of family doctors and specialists now occur even in some well-developed communities, but urban centers and remote and rural populations are chronically underserved.

We are not meeting the increasing need for physicians in rural and remote communities. There is no single determining influence on location of practice, but studies¹⁶ have shown that students from rural, remote and under-serviced communities are more likely to return to their communities of origin. However, students from these regions are under-represented in current graduating classes. In addition, Kwong et al.¹⁷ have demonstrated that higher tuition reduced the percentage of students from families with lower socio-economic incomes, frequently those from rural and remote areas. Society and governments are asking why enrolment does not reflect an equitable balance of urban and rural students. Some faculties have addressed these concerns through admission policies and recruitment activities, although outcomes still require evaluation. The U.S. and Canadian universities most successful in this regard are those with a rural mission. A clear mission causes the school: to establish a student admission policy to include recruitment from rural areas, to develop curriculum promoting rural practice, to have early clinical learning experiences and practice models which support the credibility and the viability of a graduate returning to a remote or rural practice, and includes the early involvement of family medicine faculty in the curriculum¹⁸.

Finally, governments are introducing new models of service delivery. Multi-professional teams have been a focal part of primary health care reform in Canada. Not only have these collaborative care teams been shown to improve patient outcomes but they also improve health provider satisfaction^{19,20}. Unfortunately regulated scopes of practice for the different professions, concern over liability, remuneration mechanisms and professional autonomy are all challenges that impede collaborative care and the integration of, often-complementary competencies into effective patient care²¹. Medical Schools have been even slower to introduce educational strategies that promote multi-professional care.

Distributed Learning – a New and Evolving Model to influence location of practise and meet societal needs

Universities can and do use the web to deliver knowledge-based courses almost anywhere in the world. Distributed learning therefore offers a promising model for addressing both

educational and societal needs: it incorporates remote communities; it involves their health professionals as clinical faculty, thus encouraging recruitment and retention; and it provides additional clinical teaching resources. However, its concept - that the formal curriculum, whether knowledge- or skill-based, follows the student – is an attitudinal and practical challenge to our traditional practice of giving primary responsibility for development of new curriculum and new approaches to delivery to full-time faculty based in secondary, tertiary and quaternary “teaching hospitals”. While it is still an evolving concept, it is part of expansion planning for many Canadian schools including the new Northern Ontario Medical School and the Faculty of Medicine at UBC which is developing three campuses²².

Postgraduate programs must reinforce the undergraduate experience. Most faculties have established rural programs supported by clinical faculty. In some cases research units have been established in rural communities, concentrating on evidence-based practice, population health and genetic research²³. One of the longest-standing rural educational units is Memorial’s Northern Family Medicine unit in Goose Bay, Labrador. Physicians in this unit are members of faculty, all participate in family medicine residency and undergraduate education and some have active research projects based in the north. The program offers a nine-month program for residents. It encourages independent practice while sensitizing participants to the special needs of the northern population including aboriginal peoples. The University of Western Ontario has developed a similar program for south-western Ontario²⁴. Dalhousie has successfully offered a community-based residency program in Saint John, New Brunswick and the University of British Columbia, building on its northern family medicine program, has expanded from Vancouver to Prince George and Victoria: undergraduate and postgraduate students will receive specific programs of instruction through distributed learning technology on all three campuses. The new Northern Ontario Medical School plans to use the distributed learning model and primary care preceptors in communities across northern Ontario.

It is not just the learning environment that has moved out into the community but the complete academic enterprise. These units are demonstrating models of academic practice while providing outstanding learning experiences to students. Formal evaluation

of the models has been inconsistent but several have shown improved community-based care and consistent service. The Society for Rural Physicians has assessed various programs across the country not only in terms of the percentage of graduates who enter rural practice as one measure but also how long the graduates stay in rural practice. Their annual report²⁵ lists the universities in order of success and faculties using multiple approaches to support a rural mission rank at the top of the list. Such multifaceted rural-directed programs also have been successful elsewhere, including Australia and the U.S.

As funding is made available for increased enrolment in Canadian medical schools and as the availability of classical clinical learning environments decreases, there are both pragmatic and societal reasons to extend our educational environment into smaller communities, as noted above. What factors will facilitate the development of good distributed learning? Faculties must develop clear missions that promote rural practice and implementation through specific admission policies, educational experiences and faculty role models. Effective web-based course materials must be developed.

Governments must commit to the provision of appropriate remuneration and infrastructure funding: university leaders likewise must invest in the career tracks of these teachers, fully recognizing them as community-based faculty. Development of distributed learning will mean that faculty live and function in rural and remote areas, providing academic leadership, developing focused learning objectives and demonstrating scholarly activity. At the same time, they provide consistent, current medical care. Medical education and Canadian society as a whole benefit.

New Models for Learning: Multi-disciplinary, Cross-Professional, Team-Based

Our educational systems have maintained a faculty-based educational approach. But is this suitable or sufficient in light of today's economic, political and social realities? Or should we be devising curricula that actively develop multi-professional education and the behaviours and competencies that facilitate respectful collaboration? As noted earlier, multi-professional teams have been identified as potentially more effective in health care delivery. Though reform has been slow despite this, use of such teams is gaining acceptance among the Canadian public, and, in fact, much of current primary

health care reform in Canada is focussing on multi-professional teams to provide the continuum of care, promotion of healthy living, and appropriate access to the rest of the health care system. The link between positive patient outcomes and benefit of a multi-professional learning process for students is still tenuous¹⁹. Nonetheless, this will be the new practice environment and preparing students to work in it, with specific skills in communication, collaboration and negotiation, is the logical next step in preparing physicians for the 21st century.

How does the medical school curriculum prepare students for participation in team care? Multi-professional teams are not new to the health care system: effective patient care in every area depends on them. Nonetheless, a more formal approach now is needed. A National Expert Committee is advising Health Canada on developing multi-professional learning projects that will promote collaborative practice. Curran's extensive literature review²⁶ on the benefits and challenges of developing an inter- or multi-professional curriculum supports the need for all medical schools and other health professions' schools to consider how curriculum can be developed to support learning in this concept of care. He also identified significant barriers to implementation of such learning, including a lack of financial resources, a lack of perceived value by faculty and students, "turf battles" and lack of specific rewards for faculty. Much work remains to be done.

An essential early step, developing curriculum, which promotes multi-professional collaborative learning, requires new resources. These are at hand: Health Canada is announcing a significant investment in multi-professional curriculum design and management through calls for proposals. Two phases of funding for more than a dozen large projects will be established over the next three years. These will involve medical faculties, nursing faculties and at least one other health professional faculty and will establish the curricula and learning environments that provide the knowledge, skills and attitude development that enable students to work effectively in teams.

Learning together, demonstrating profession-specific competencies, understanding and respecting other health professionals' competencies will not only enable our graduates to

participate effectively in multi-professional care but should also help schools to manage their teaching responsibilities in the face of increasing enrolment and declining faculty numbers.

Conclusion:

The traditional base for medical education in Canada, the “teaching hospital” has changed through regionalization and hospital restructuring. As a consequence, medical education in Canada is under stress. The education continuum requires re-thinking and re-shaping. Every component of academic medicine is being strained by our lack of self-sufficiency in physician supply; the pressure to increase enrolment; the need to provide care and learning outside traditional educational centers; the need to develop and adapt to new models of care; the need to effectively integrate the rapidly expanding knowledge base while maintaining the current internationally-recognized quality of education, research and clinical care in the academy. Schools in Canada have made changes in their curricula but these have tended to evolve in a reactive way from within the traditional centre. To accommodate the major changes expected in the next ten years, a major paradigm shift is required. Student clinical teaching will have to move outside the academic health science centre and the formal curriculum will need to follow their movement. Faculty members in the smaller dispersed learning units will require academic standing and clear career tracks. Collaborative professional practice will have to be developed, modelled and taught as part of the clinical learning experience. The continuum of life-long learning will have to be integrated into undergraduate and postgraduate education. It cannot be a concept: it must be a functioning visible reality that allows the necessary competencies to be assessed and examined. Postgraduate education will continue to provide basic specialty education and perhaps some sub-specialty skills with certificate recognition but further competencies will be achieved through supervised educational programs developed for the practicing clinician. Programs must have clear objective- based competencies, defined curriculum and appropriate recognition following peer assessment and confirmed mastery of the competency and must continue to be monitored by accrediting agencies. The only

educational units that can work to bring about true life-long learning are faculties in the health disciplines. With only 17 faculties, 13 regulatory bodies and two Colleges, Canadian health education leadership is small in numbers and often overlapping. This should create a fertile opportunity for collaboration on change. Society gives us the privilege of self-regulation: this also gives us the responsibility to adapt our learning mechanisms to society's needs. We must create a more responsive health education system for our students, for ourselves, and for Canadian society. If we fail to do so, then, to quote a long forgotten comic strip hero, Pogo, "I have seen the enemy and he is us."

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