



The College of
Family Physicians
of Canada

Le Collège des
médecins de famille
du Canada

Rethinking Undergraduate Medical Education

A View from Family
Medicine

Prepared by the Undergraduate
Education Committee of the College of
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Executive Summary:

Undergraduate medical education has improved dramatically in the past century, but it is still fundamentally flawed by the dominance of an outmoded biomedical model that pervades the curriculum. There is widespread recognition that medical education must change to keep up with the transformations in medical practice and the expanding understanding of how people learn. Family medicine offers a perspective and a setting that can enhance student experience – patients seen in a family practice more closely represent the demography of illness in the community; undifferentiated patients seen in the earliest stages of their illnesses are more appropriate for learning clinical reasoning; ambulatory patients are more autonomous and are better suited for learning clinical judgment and finding common ground; personal, family and other contextual factors are more apparent thus demonstrating the importance of addressing all of the determinants of illness; care is provided over many years thus illustrating the central role of the patient-physician relationship.

Throughout recorded history, two different models have been employed to understand human sickness and the role of medicine – the traditional biomedical model and the whole person model. Each model has a distinctive focus and approach and reflects quite different philosophies. In recent decades, the biomedical approach has reigned supreme – it has been remarkably effective in explaining and curing many conditions but, by itself it is incomplete and we need to rebalance the educational scales. Patients expect more than technical expertise; they want physicians who will connect with them at a human level, listen intently to their concerns and involve them in decisions about their care. Efforts to supplement the biomedical model with effective communication skills and attention to the patient’s personal situation are helpful but they do not address the basic flaw in the traditional reductionist approach that views the body as a machine and ignores the complex interactions and feedback loops among mind, body and environment that contribute to causality and offer comprehensive approaches to management. We need a transformation in our understanding of human sickness that recognizes the body as an organism with natural healing powers to be supported and enhanced by our interventions. The outmoded scientific method used in medicine values “objectivity” and warns physicians to bury their feelings lest they influence their clinical reasoning. Medicine must become self-reflective and value subjective experience; physicians must have a deep understanding of themselves and their feelings so that they can better understand and relate to their patients.

Medical education has been the subject of much examination and review in the past century since the famous Flexner Report of 1910. Ironically, Flexner’s Report created a “2+2” template for medical education – two years of basic science followed by two years of clinical experience – that Flexner never intended. And many of his most radical changes were never implemented. The next big review, the GPEP (General Professional Education of the Physician) Report of 1984 focused on teaching methods to improve student learning and the importance of behavioural and social sciences to broaden the curriculum. But it too failed to bring about the changes its authors desired. Since then there have been a plethora of reports and recommendations. But none of them has considered the unique insights that could be offered by a view from Family Medicine.

A major barrier to change is the hidden curriculum – the unwritten code that shapes the values and behaviours of teachers and their students, especially in the clinical setting. Curriculum change has focused primarily on the preclerkship years and, until recently, has left the clerkship years untouched. But it is in the clerkship that students learn to think, act, and feel like doctors. Whatever they learn in the early years is quickly lost if it is not reinforced by their clinical teachers. Recently, many schools have experimented with new ways to conduct the clerkship – approaches that provide exposure to a group of patients in a community practice over several months. When compared with their peers, who take the traditional clerkship, they perform at least as well or better on standard tests of knowledge and skills and better on understanding how the social context affect their patients. In addition, they were more likely to enter into primary care in a small community after graduation.

Changes are needed in many aspects of medical education, especially in the clerkship. But changes are also needed in the preclerkship years to set the stage for a transformed clinical experience. Family physicians and other generalists should play a larger role in teaching; students should have clinical exposure to family physicians and other generalists in all years of medical school. Clerkship should provide a longitudinal experience of at least 3 months duration in a single family medicine setting where students will have the opportunity to develop ongoing relationships with a group of ambulatory patients and healthcare providers in a community setting and schools should be encouraged to develop integrated clerkships in a community practice 12 months or more in duration.

These changes will require extensive faculty development, protected time for teaching, and career advancement for contributions to teaching. Financial and other resource need to be allocated so that teachers in all sites are appropriately supported.

The Report concludes with a series of 30 recommendations – 12 guiding principles for the curriculum as a whole, 8 recommendations regarding the preclerkship years and 10 regarding the clerkship. We list here one recommendation from each of these three areas:

- Generalist faculty (family physicians, general internists, general surgeons and general pediatricians) should have a central role in teaching in all years of the curriculum especially such topics as: clinical reasoning, integration and application of basic science knowledge with its clinical relevance, communication skills, health promotion, professionalism, community health, the family and community context of illness, inter-professional teamwork, the role of healing, and the centrality of the patient-physician relationship. Family physicians’ key role must be demonstrated by assuring the appropriate presence of family physicians in all years and all aspects of the curriculum so that students will appreciate the role and relevance of family physicians.
- Teaching methods should be based on an evolving understanding of how people learn with special emphasis on approaches that enhance transfer of learning from the preclerkship years to the clerkship and beyond.
 - a. Factual overload must be eliminated to provide time for deep learning.
 - b. Teaching methods should emphasize students’ active involvement in their own learning rather than passive acquisition.

- c. Frequent opportunities should be available, in all years of the curriculum, for students to interact with real, simulated and virtual patients to help them integrate and transfer concepts learned in preclinical courses with their clinical relevance.
- Clerkship should provide a longitudinal experience of at least 3 months duration in a single family medicine setting where students have the opportunity to develop ongoing relationships with a group of ambulatory patients and healthcare providers. Opportunities should be available to follow a group of patients including those needing:
 - a. episodic care of undifferentiated problems,
 - b. management of chronic disease
 - c. health promotion, disease prevention, and rehabilitation
 - d. advocacy

Rethinking Undergraduate Medical Education – a View from Family Medicine

“The need for a fundamental redesign of the content of medical training is clear. (Cook, Irby, Sullivan, Ludmerer, 2007)

“It is important not to underestimate the magnitude of the changes implied in the transformation of our clinical method. It is not simply a matter of learning some new techniques, though that is part of it. Nor is it only a question of adding in interviewing and behavioral science to the curriculum. The change goes much deeper than that. It requires nothing less than a change in what it means to be a physician, a different way of thinking about health and disease, and a redefinition of medical knowledge.” (McWhinney in Stewart, 2003)

Overview:

Although undergraduate medical education has improved dramatically in the past 100 years, it is still fundamentally flawed. When Flexner submitted his famous report on medical education in 1910, his sweeping recommendations catalyzed important changes and created a mold for medical schools that is still influential worldwide. Dozens of inferior schools closed and a new standard for medical education in North America was established – education in basic science in a university-affiliated institution followed by a supervised clinical apprenticeship. (Flexner, 1910) In 1981 the Association of American Medical Colleges commissioned a major review of medical education in North America which culminated in the report on the General Professional Education of the Physician, widely known as the GPEP Report. The Report emphasized the importance of independent learning and a broadening of the curriculum to include the social sciences and the humanities. (The Panel on the GPEP, 1984) Calman, in his recent history of medical education, provides an excellent summary of the key reports on medical education from the U.K. and the U.S. in the past 100 years. (Calman, 2007) Christakis reviewed twenty-four major national reports calling for specific changes in medical school curricula written between 1910 and 1993. He writes:

“The reports are remarkably consistent regarding the objectives of reform and the specific reforms proposed...Reforms such as increasing generalist training, increasing ambulatory care exposure, providing social science courses, teaching lifelong and self-learning skills, rewarding teaching, clarifying the school mission, and centralizing curriculum control have appeared almost continuously since 1910.” (Christakis, 1995)

Currently, the Carnegie Foundation for the Advancement of Teaching is conducting a study of “the common challenges of preparing physicians for complex practice and some of the distinctive curricula, pedagogies and assessment practices that have been developed to meet these challenges.” (See Appendix III)

While these recommendations look good on paper, they are not always translated into meaningful change in the “curriculum as experienced” by the students. (Christakis, 1995; Bloom, 1988) Missing from all of these reports is any reference to a serious role for family medicine in the curriculum or any significant challenge of the biomedical hegemony dominating most curricula. Over 20 years ago, Bloom described a long history of “reform without change, of repeated modifications of the medical school curriculum that alter only very slightly or not at all the experience of the critical participants, the students and teachers.” He goes on to argue that the structure of medical schools inhibits real change because of the dominance of a reductionist approach which involves “faith in rational solution of medical problems, disinterested concern for patient and society, and dedication to competence in practice and to the community of science which transcends personal interest. The corollary of these values is a disinclination to give serious attention to the social, behavioral, and personal dimensions of illness. Subjects like family, community, and preventive medicine or sociology are intellectually peripheral.” (Bloom, 1988)

The pace of change in medicine and medical education has quickened in the past decade with many new challenges. There are many new ideas being incorporated into medical school curricula worldwide – new topics, new ways to teach and assess learning, new ways to learn, new settings for clinical experiences, and new partnerships with other faculties both in and beyond the traditional health sciences. Although much is right about modern medical education (see Appendix I), there are serious failings (see Appendix II). The time is right for another examination of undergraduate medical education – an examination that will truly rethink what we are doing and incorporate the unique insights that can be offered by a view from family medicine.

Why a View from Family Medicine?

While we argue, throughout this discussion paper, that family medicine can make distinctive contributions to undergraduate medical education, it is important to avoid a “more holistic than thou” stance. We recognize that family physicians are no more caring or compassionate than our specialist colleagues. Generalists from many disciplines can offer valuable experiences in assessing undifferentiated patients. Community-based specialists can provide important opportunities to learn about the broad determinants of health. Specialists who follow groups of patients over many months or years will model the importance of continuity and relationship-centred care. But family medicine is the only discipline that combines all of these elements of patient care.

Family physicians see different things and see things differently. A classic study by White and Greenberg (1961) demonstrated how common it is for people to suffer from illness, how often they handle it on their own and how rarely they end up in a university teaching hospital. Of the 750 people who report one or more illnesses each month, only one ends up in a teaching hospital where most medical education occurs. When Green and colleagues repeated this study in 2001, the results were almost the same. (Green, Yawn, Lanier, Dovey, 2001)

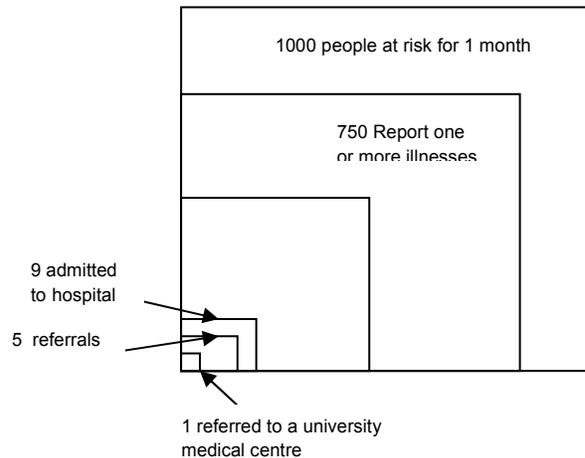


Figure 1 – The Demography of Illness in the Community
(White & Greenberg, 1961)

Features of family practice that make it an ideal setting for learning medicine:

- As a generalist discipline in an ambulatory setting, family medicine is uniquely suited to teach the clinical method – interviewing, history taking, physical examination and use of the laboratory. Although the hospital is an ideal location to learn specialized skills and to see the serious conditions that are rare in a community setting, patients in hospital settings are often too sick to have students practice their skills on them.
- Ambulatory patients are able to have a greater say in the management of their illnesses than are seriously ill patients in the hospital. Consequently, finding common ground with patients can best be learned in the ambulatory setting.
- Family Medicine also provides an integrating function particularly in the clerkship where students need an opportunity to “put it all together” – to see undifferentiated patients before they are worked up and categorized.

Features of family practice that make the community and social context of illness more prominent:

- Because family practices tend to be located in the midst of the communities which they serve, patients will be seen in their context – the impact of their illnesses on their day-to-day functioning and on their families is more obvious as is the influence of life circumstances on the development of illness. For example, poor air quality, drug trafficking, lead pollution, social disruption, and poverty will all be apparent to physicians who practice in the neighbourhood where their patients live.

- At least one-third of patients presenting to a family physician have significant emotional problems (Anseau et al, 2004; Cwikel, Zilber, Feinson, Lerner, 2007) which are commonly the result of relationship difficulties, unemployment or poverty.
- For patients with chronic illness, visits to the doctor are more likely to be triggered by a change in their social situation than a change in the disease.
- The social network for care has become incredibly complex with numerous conventional and unconventional care providers, publicly funded community agencies, private agencies, volunteer organizations as well as family and friends. Sorting out where to get help for each problem is difficult enough for a professional; for a patient, beaten down by disease, it may be overwhelming. The family physician and his or her staff are important advocates for their patients.
- Home care and long-term care are important services which require input from family physicians on behalf of their patients.
- Home visiting is a rich source of information about the impact of illness on patients and their families. It is harder to ignore the needs and the suffering of the identified patient's caretaker when you see first-hand what is happening in the home.
- The home-hospital is becoming a reality in many communities and much sicker patients are now being cared for in the home by their family physicians. This is an excellent opportunity to hone the skills of clinical assessment without the immediate availability of x-rays and laboratory investigation.

Family medicine and a reflective approach to the curriculum:

Schön (1983, 1987) provides valuable insights into the nature of clinical problem solving. Learning to be a physician involves learning to recognize, analyze and manage clinical problems. The nature of these problems should influence the nature of medical education. Clinical problems are often not well-formed problems but rather messy, indeterminate situations. This is particularly true of problems in primary care. Once the patient is referred or admitted to hospital, their problems are often much clearer. The clinician's first task is to determine the nature of the problem. In framing the problem, practitioners decide what they will notice and pay attention to and what they will ignore. For example, when a patient presents after a fight with his wife, with vague chest pains of several months' duration, several questions are raised. Is the problem "atypical angina" or "chest wall pain" or "marital discord", or is it somehow related to the stress of coping with a developmentally delayed daughter in the family, or is it a complex combination of these?

Making a diagnosis in the early stages of disease, before the classical picture is present, is particularly challenging. As McWhinney states:

"The recognition of disease in its earliest stages calls for clinical expertise of the highest order. This is a skill which cannot be learned in hospital. The practitioner's basic difficulty is that he has to deal with undifferentiated clinical problems. The early symptoms of serious disease differ so

subtly from those of minor ailments that to the unpracticed eye they are identical.”
(McWhinney, 1964)

Often a problematic situation presents itself as a unique case that is not “in the textbook” and does not fit any of the official guidelines for management. To deal with such a situation, practitioners must improvise, invent and test unique strategies. Schön argues that practitioners require a core of professional artistry. Conflict of values is common. There are often competing views of the problem and of the recommended solutions and no clear-cut answers. Uncertainty is rife. Problems are often problematic in several ways at once, for example:

- The symptoms do not match any known disease;
- the resources are inadequate to investigate or treat the problems properly;
- the patient and physician do not agree on a treatment plan.

Schön uses an analogy comparing two landscapes – “the high ground” and “the swamp”. On the high ground, patients present with problems at least partially defined and the biological sciences are helpful for understanding the problem. The clinician's task is to rule in or rule out a few clearly defined disease entities. If disease is identified, the standard therapy is prescribed; if no disease is found, the patient is reassured with the expectation that he or she will be satisfied. In the swamp, where most clinicians work, the job is not as clear-cut. The traditional basic sciences may not be helpful in understanding the problem. Sometimes no disease can be identified to explain the patient's suffering and even when disease is found, there may be no effective treatment. Frequently co-morbidity or underlying social factors make the situation more complex. For example, a patient with diabetes may be struggling with ischemic heart disease, an abusive marriage and illiteracy. The physician, in collaboration with other healthcare professionals, will provide assistance for *all* of her problems. Alleviating the patient's social problems may be an essential aspect of managing her biomedical illnesses. Other times it is more helpful to explore the patient's worries, listen to the patient's story and establish an empathic connection – the physician's fundamental task in this case is to provide emotional support and care rather than cure.

Schön argues that our traditional curricula, based on the false assumption that clinical medicine is simply applied basic science, do not prepare our graduates for the complexity of clinical work. Students need to be exposed to the “messiness” of clinical medicine early in their education so that they can learn the limits of the biomedical model, learn how to tolerate the ambiguities and uncertainties of medicine and develop the artistry of clinical practice. Mathers and Rowland (1997) argue that general practice is a post-modern specialty. The *modern* view of the world holds that we can know the world ‘out there’ using the scientific method and assumes that this knowledge is uncontaminated by the mind of the knower. A *modern* approach to curriculum design focuses on aims and objectives, content, teaching process and assessment and evaluation. It is a linear, mechanistic process akin to the biomedical model. A *post-modern* approach is more fluid and complex. In this approach, teachers and students create a dialogue focused on critical incidents in the curriculum as experienced. In the process of trying to understand and trying to change the problematic aspects of the curriculum they find the right questions to ask and reach a deeper understanding of the learning process and how it needs to change.

“The educational values of a curriculum based on such a reflective or critical model of professional practice would be practical, active and pragmatic, and could encompass all the current models of general practice. The implied teaching methods of this model, such as practical attachments (‘apprenticeship’) and small group teaching, would be more appropriate than didactic lectures. Methods of assessment would be mainly by portfolios, projects, continual assessment, competencies and peer review rather than MCQs and OSCEs...In addition, the curriculum would have ‘street credibility’ with the majority of GPs, since it would be based in the ‘real world’ – the ‘swampy lowlands’ of everyday practice where chaos and uncertainty are ever present!” (Mathers et al, 1997)

If medical school is about education and not just training, then it should embrace a philosophy of liberal education and include the humanities in the curriculum. In his lecture at Johns Hopkins, Robertson Davies argued that the greatest malaise of humankind is not cancer or AIDs or tobacco smoking – it is stupidity. He challenges physicians “to assure complete inoculation against the plague by massive daily applications of art, music and literature” (Davies, 1997). In his James Mackenzie lecture, Sweeney (1998) describes the place of the humanities in the education of a doctor – to enhance our understanding of our patients’ suffering by expanding our conceptual framework. He offers a rich survey of writings about the arts, the importance of patients’ narratives and the power of the humanities to deepen empathy and insight. McWhinney challenges us to make medical education self-reflective:

“We can only attend to a patient’s feelings and emotions if we know our own, but self-knowledge is neglected in medical education, perhaps because the path to this knowledge is so long and hard. Egoistic emotions often come disguised as virtues and we all have a great capacity for self-deception. But there are pathways to this knowledge and medical education could find a place for them. Could medicine become a self-reflective discipline? The idea may seem preposterous. Yet I think it must, if we are to be healers as well as competent technologists...The fault line runs through the affect-denying clinical method which dominates the modern medical school. Not until this is reformed will emotions and relationships have the place in medicine they deserve. Finally, to become self-reflective, medicine will have to go through a huge cultural change. In these changes, general practice is already some distance along the way. The importance of being different is that we can lead the way.” (McWhinney, 1996)

Historical Background - Two Models of Medicine:

It is time to challenge our preoccupation with biomedicine in the education of physicians. No one would dispute the importance of biomedical science in alleviating human suffering from disease. But many would challenge the unwillingness to recognize the limitations of the biomedical approach or the need for additional ways to understand human sickness. (Lipkin, 1987; Engel in White, 1988)

An ancient statue of Asklepios, the Greek god of medicine, with his two daughters, Hygeia and Panakeia, symbolizes two approaches to medicine that have been important throughout history. (Renaud, 1994)

Hygeia became the goddess of prevention; Panakeia, the goddess of treatment. The perspective of Panakeia is *ontological* – it focuses on finding the disease, the "thing" that is wrong, and fixing it. The approach of Hygeia is *physiological* – it examines the whole person in his or her environment and seeks ways of living wisely and promoting healing. The first approach, the search for a panacea, is dramatic and exciting and appeals to our deep longings for immortality. It emphasizes the physician's curative role – diseases are real entities, separate from the person, to be discovered and then eradicated by specific remedies.

The second approach, which emphasizes living sensibly, with moderation in all things, has much less appeal in an age of technology and "miracle" cures. This approach emphasizes the physician's role in patient education and support and places greater demands on the personal qualities of physicians. Disease is not seen as an entity with a life of its own but as inseparable from the sick person in the context of his or her family and environment. Classifying the disease is not as important as making a healing connection with the patient and assisting the "vis medicatrix naturae" – the healing power of nature.

The co-existence for millennia of two such divergent approaches to medicine suggests that the mysteries of disease are too great to be encompassed by either model alone. It is important for physicians to understand both approaches. But the overemphasis, in the past fifty years, on the traditional biomedical approach has obscured the approach of Hygeia; it is a major reason that we need to rethink how we educate physicians.

Comparison of Two Historical Models of Medicine

Traditional Biomedical Model → Panakeia

- Reductionist – focus on the “broken part” and fix it
- The “body as a machine”
- Correct the faulty mechanism
- Linear causation, single causes & “either/or” thinking
- Mind-body distinction
- Focus on diseases as entities separate from the person
- Emphasis on traditional basic sciences – physiology, anatomy, pathology etc.
- Strive for certainty
- Physicians need to remain objective, detached observers → physician as clinical scientist

Whole Person Model → Hygeia

- Systemic approach – address the big picture – the “whole patient” & context
- The body “as an organism”
- Support the organism’s natural healing powers
- Complex causation e.g. complexity theory & “both/and” thinking
- Integration of mind-body
- Focus on the person & their experience no matter what the problem
- Integration of behavioural sciences & humanities with the biological & population sciences
- Accept the inevitability of uncertainty
- Physicians need to be involved & use their subjectivity & emotional intelligence → physician as healer

Pauli, White and McWhinney (2000), in their seminal three-part paper, challenge us to consider a new

paradigm for medicine and medical education. They argue that “The extraordinarily productive contemporary biomedical model should be expanded beyond the physical and biological to incorporate meaningful information about how each patient’s experiences impinge on health status....health professionals directly confront a growing body of data that no longer can be explained or dealt with by the traditional paradigm, and as a consequence there are increasingly serious ‘internal’ reasons for a fundamental reexamination of that paradigm.” For example, the International Classification of Diseases fails to provide categories for half of the problems which patients bring to their family physicians.

They urge us to “consider a vision of a reformed medical curriculum. Why should students not be introduced to medicine at its truly basic level, envisaging a *somatopsychosociocultural* model, drawing on existing *systemic sciences* concerned with the interactions of individuals and their environment such as the neurosciences, immunology, epidemiology, psychology, and sociology?” (Pauli, White, McWhinney, 2000) Sturmberg offers a number of concrete suggestions for improving the curriculum based in his experience in general practice. Three important textbooks of family medicine provide important insights into a multidimensional approach to healthcare which could guide in developing a curriculum based on this new paradigm – McWhinney’s *Textbook of Family Medicine* (1997), Jones et al’s *Oxford Textbook of Primary Medical Care* (2004), and Greenhalgh’s *Primary Health Care – Theory and Practice* (2007).

The Flexner Report:

Often quoted, but rarely read, the Flexner Report has had a major influence on medical curricula for almost a century. (Jonas, 1978; Barzansky, 1992; Bonner, 2002) Sponsored by the Carnegie Foundation, former high school teacher Abraham Flexner visited all 155 medical schools in North America and recommended closing all but 31 of them in his landmark report of 1910. After visiting a number of schools, especially his alma mater Johns Hopkins, he developed a view of the ideal approach to medical education embodying the best features of medical education in England, France and Germany. He reviewed the entrance qualifications, faculty size, college finances, laboratories and hospital facilities. (Calman, 2007) Many of his recommendations were adopted, especially those that were already being promoted by the American Medical Association and the American Association of Medical Colleges.

Flexner used his influence to secure grants from philanthropists to restructure some of the more promising schools. By 1924 half the colleges had disappeared, especially the poor quality for-profit schools. Johns Hopkins became the model that other schools strived to emulate – medical schools should be university departments, students should be active learners with opportunities to practice their skills and learn the scientific method, each school should be connected to a hospital and a laboratory, and students should become proficient in using the library to keep up to date.

Although Flexner’s report catalyzed many important reforms of medical education, only some of his recommendations were implemented; many of his suggestions were considered too radical. In a thoughtful review of Flexner’s report, Jonas (1978) provides some insights about the political landscape in the early 1900s and fleshes out the many suggestions that, even now, would be revolutionary:

“A careful reading of the Flexner Report reveals a design for a good medical education system which is quite different in many respects from the one which had developed in the sixty-five years since the Report was published....

“Preventive medicine would be stressed...The concept of the social nature of the physician’s work and the social responsibility of the physician would be among the most basic tenets of the educational philosophy. ...The most important task of the medical educational process would be to teach the understanding and use of the scientific method. Thus the didactic-lecture/rote-memorization method of teaching, and examinations would be of limited utility. Lectures would be used primarily for introductions to and summations of subject areas....To the greatest extent possible, basic medical science teaching would be integrated with and made relevant to clinical teaching....

“Understanding the social role of the physician and the social nature of medical practice would be important parts of the curriculum. Thus by implication, epidemiology, biostatistics, health care delivery systems analysis, medical history, ethics, behavioural science, and sociology, political science, and economics as they apply to health and health care delivery would occupy central places in medical education, rather than being at or beyond the fringe as they now are....

“Teaching medicine in ambulatory care settings would be stressed, since that setting more closely approximates the one in which the majority of practitioners work than does the inpatient side of a university hospital...

“This is quite a radical prescription. To implement it widely today would require a national political upheaval of titanic proportions, if not a revolution. This is to say nothing of the educating and reeducating which would be necessary to train medical school faculties which could teach in the true Flexnerian mode.” (Jonas, 1978)

The GPEP Report:

While there have been many reviews of medical education in North America since the GPEP Report, this was the last major review of medical education in the U.S. and Canada. The Project Panel consisted of 29 leaders in higher education including university presidents, department chairs and the Dean of an English faculty. They heard submissions from 96 U.S. and Canadian schools and another 43 submitted written reports. In addition, during its 30 months of deliberations, the Panel provided public hearings and received written reports from representatives of 83 medical schools, 24 colleges and universities, 21 professional societies, and 11 other groups. The Report made recommendations concerning the admission process, curriculum content, teaching methods, governance, budget, and resources. The philosophical basis of its recommendations was the belief in the importance of preparing students to learn throughout their professional lives. “This learning must be self-directed, active, and independent. The formal educational process should emphasize assisting the student to develop the ability and desire to

continue acquiring and applying knowledge in solving problems.” (The Panel on the GPEP, 1984) While the GPEP Report made many valuable recommendations to improve the student experience, “it failed to answer the question: What is the purpose of the educational program? ... It is not surprising, therefore, that many continue to view the program’s primary purpose as preparing graduates with factual information and a set of skills for the practice of medicine, or at the very least, as preparation for residency training. The result is that there is substantial resistance to making changes in traditional clerkships.” (Whitcomb & Nutter, 2002)

The EFPO Project, the CanMEDS Framework and the Four Principles of Family Medicine:

In 1990, as a result of recognizing widespread public dissatisfaction with physicians, the five medical schools in Ontario launched a collaborative project – Educating Future Physicians for Ontario – to determine “what the people of Ontario expect of their physicians, and how the programs that prepare future physicians should be changed in response...Eight physician roles were identified: medical expert, communicator, collaborator, health advocate, learner, manager (“gatekeeper”), scholar, and ‘physician as person’.” (Neufeld et al, 1998) The overall goal of the Project was to modify the character of medical education in Ontario to make it more responsive to the evolving needs of Ontario society. The Project continued for 11 years and altered the landscape of undergraduate education in the province (Maudsley, 2000):

- The definition of medical competence was broadened in response to the expectations of the public. No longer was it sufficient to simply be a medical expert; additional abilities were required as embodied in the description of the other seven physician roles. The roles were used as a framework for curriculum renewal, faculty development, and student assessment at each school.
- Medical schools collaborated as never before. Prior to the Project, the schools often competed, criticized one another, and had a poor understanding of each other’s curricula. During the project, all schools met regularly, shared ideas and resources, and learned from one another. As Jock Murray stated in his external review of the Project, “This is one of the largest and most visionary experiments in the history of medical education....It is being watched by medical educators and leaders throughout the world.” (Murray, 1992) Because of the long duration of the Project, friendships and working relationships developed among faculty from each school and patterns of collaboration and support became part of the culture of medical education in the province.
- Faculty development was an important tool for implementing change. The Fellowship Program provided support for faculty, residents and students to devote time to educational scholarship. Interest grew in medical education as a career track and larger numbers of faculty than ever before pursued additional training, including master’s degrees, in medical education.
- Perhaps the most important outcome of the EFPO Project was the stimulus to develop the CanMEDS Project.

The CanMEDS Framework:

In 1993, recognizing the “tumultuous changes in medical practice” (JR Frank, 2005), the Royal College of Physicians and Surgeons of Canada began a review of postgraduate education for the specialties with the goal to “identify the core competencies generic to all specialists to meet the needs of society.” (JR Frank, 2005) The College, building on the work of the EFPO Project, heard from expert panels and focus groups, conducted a systematic literature review, consulted broadly with other healthcare organizations, and conducted a modified Delphi process to identify the physician roles that represent the core competencies. Seven roles were identified. Five roles were identical to the EFPO physician roles – expert, communicator, collaborator, advocate, and manager. The EFPO learner role was combined with the scholar role and the EFPO “physician as person” role was changed to the professional role. Since 2002, the College has been providing extensive faculty development to inform all teachers in all programs about the Framework of essential competencies and offer workshops on how to teach each role. From 2003-2005 the College convened eight working groups comprised of Fellows and family physicians to review and update the Framework. As a result of this extensive review, the description of each role was clarified and the original core CanMEDS concepts were revalidated. The Roles Framework is now being used for accreditation, certification and examination standards.

As the EFPO Project did for physicians in Ontario, the CanMEDS Framework has redefined medical competence for all specialists in Canada. “...CanMEDS has not only been implemented in Canada, it has also been adopted by numerous jurisdictions around the world. The ideas of CanMEDS now shape medical education and medicine at the bedside, in the laboratory, in the operating theatre, in the classroom and in numerous other settings. CanMEDS describes physician abilities to meet the needs of patients in the 21st century.” (JR Frank, 2005) The Framework is also being used by several medical schools in Canada as a framework for describing the educational objectives of their undergraduate programs.

The Four Principles of Family Medicine:

The College of Family Physicians of Canada has a long history of educational planning and development. In the 1970s and early 1980s, the College endorsed the national objectives for certification. In 1985 this long list of objective was replaced by the Four Principles of Family Medicine which were later revised in the 1990s. A principle is “a personal or specific basis of conduct or management; a determining characteristic of something, essential quality” (Stein, 1966) As such, the four principles provide an overarching framework for understanding and teaching the discipline of family medicine:

- The family physician is a skilled clinician
- Family medicine is community-based
- The family physician is a resource to a defined practice population
- The doctor-patient relationship is central to the role of the family physician

The “four principles approach” reflects the patient-centred clinical method as described by the group at Western (Stewart et al, 2003) and thus emphasizes a transformed approach to patient care. Some educators have argued that the four principles and the CanMEDS physician roles are just two ways to say the same thing; others have suggested that the physician roles can be used to describe how the principles can be

achieved. But attempts to harmonize the two frameworks have been unsuccessful. This probably reflects recognition of the uniqueness of family medicine as a discipline:

“The essence of general practice is an unconditional and open-ended commitment to one’s patients. We define ourselves in terms of this relationship. Clinicians in other fields form relationships with patients but their commitment is to patients who have a disease or problem within their specialty. Most other fields define themselves in terms of content: diseases, organ systems or technologies. In general practice, the relationship is usually prior to content. We commit ourselves to patients before we know what their illnesses will be.”
(McWhinney, 2003)

The “Not So Hidden” Curriculum:

The “hidden” or informal curriculum powerfully molds the attitudes and values of faculty and students alike. (Hafferty & Frank, 1994; Hafferty, 1998; Margolis, 2001; Inui, 2003) It is more influential than the written objectives and may even be at odds with the stated curriculum in the medical school calendar. The hidden curriculum is so influential because it is taught by example (Bandura, 1985). It is contagious – students “catch” the lessons of this tacit curriculum through immersion in the system. Because it is part of the unspoken culture of medical school, it is not subject to critical reflection but simply taken for granted. Therefore it requires a concerted effort on many fronts to change. Curriculum reform typically ignores the hidden curriculum and, as a result, only minor change is accomplished.

“Dewey stressed that the role an individual is assigned in an environment – what he is permitted to do – is what the individual learns. In other words, the medium itself, i.e., the environment, is the message. ‘Message’ here means the perceptions you are allowed to build, the attitudes you are enticed to assume, the sensitivities you are encouraged to develop – almost all of the things you learn to see and feel and value. You learn them because your environment is organized in such a way that it permits or encourages or insists that you learn them.” (Postman and Weingartner, 1969)

The hidden curriculum has been defined as “the set of influences that function at the level of organizational structure and culture including, for example, implicit rules to survive the institution such as customs, rituals, and taken for granted aspects” (Lempp & Seale, 2004) Some related concepts – tacit learning, unintended consequences of schooling, socialization, role development, unstated objectives, enculturation, learning the informal rules. It is taught by subtle, out-of-awareness things that pervade the whole educational environment (Bevis and Watson, 2000):

- When classes are scheduled
- How much time is given to a subject
- How many test items are assigned to a topic
- Who addresses whom in what way
- How teachers respond to students who openly differ in opinion from the teacher

- How students are or are not encouraged to work together
- How teachers interact with students

McWhinney addresses the power of the hidden curriculum to shape student learning:

“If students have their clinical training mainly in hospitals, especially tertiary care hospitals, they will get the message: ‘this is what disease is, and this method for investigating it is the method of medicine.’ If they never care for a patient at home, the message will be ‘the home is no place for a physician.’ If they are taught mainly by specialists, they will get the message: ‘this is where authority, prestige, and power lie.’” (McWhinney)

Some of the lessons taught by the hidden curriculum:

- Biology trumps everything else – medicine is applied biology
- Behavioural issues are just “common sense” – it’s OK to ignore the sciences that explain behaviour
- The humanities are “nice to know” but can be ignored if time is needed to learn important subjects
- “Feelings are irrelevant in education.” (Postman and Weingartner, 1969)
- The more hours a subject has in the curriculum, the more important it is
- No matter what you learn in class, it’s what you see your seniors do that really counts
- Doctors are the key players in the health care system
- Specialism is more important than generalism
- Tertiary care is more important than primary or secondary care
- Factual knowledge is more important than attitudes or skills
- Being able to recite the latest fact is more valued than a deep understanding of concepts. “Recall is the highest form of intellectual achievement and the collection of unrelated ‘facts’ is the goal of education.” (Postman and Weingartner, 1969)
- Acute care is more important than preventive or chronic care
- Research is more important than teaching or education
- It is dangerous to become “too” involved, “too” reflexive, or “too” introspective (Hafferty & Franks, 1994)

Assessment: (Brown & Knight, 1994; Palomba & Banta, 1999)

Assessment has often been called “the tail that wags the dog”. Students pay more attention to what they expect on the exam than to the long lists of educational objectives. When the curriculum is overcrowded students adopt survival strategies such as skimming and cramming. They focus their energies on topics that might appear on an exam and ignore other topics. Although well-written multiple choice questions (MCQs) can test higher order knowledge, faculty often lack the time or skill to write them. As a result, the majority of MCQs tend to be at the level of factual recall thus rewarding students for superficial learning just well enough to recognize the right answer on the test. A variety of different formats for written tests have been advocated as alternatives to MCQs but none has been shown to be superior to well constructed multiple

choice tests. The challenge is to find ways to persuade faculty to spend the time and energy to develop good questions. Schools must recognize and reward such activity.

Assessment of non-cognitive factors – communication skills, interpersonal skills, and attitudes – is even more problematic. If these factors are not assessed in a robust manner, students get the message that they are not important, no matter how loudly we proclaim their value. Reflective journals have been introduced in several schools to enhance reflection and mindfulness. The Objective Structured Clinical Exam (OSCE) has become a standard tool for assessing communication skills. One challenge is the content specificity of communication skills – a student may perform well with a patient with diabetes but not with another patient with cirrhosis. Consequently, OSCE exams must have a sufficient number of stations to provide adequate reliability for high stakes exams. The measurement properties of examination instruments are important – if they are not reliable and valid, they are meaningless. But it is very difficult to create exams that are high in both; the more valid the exam, the less reliable it tends to be and vice versa. As Marinker states: “Reliability is about competitive fairness to students. Validity is about responsible justice to their future patients.” (Marinker 1997)

“Both [reliability and validity] are important and no one method of assessment is likely to meet all requirements. Learning and assessment are integral to each other, we must ensure students are learning what we want them to and take care not to let reliability override that which is truly important.” (Cushing, 2002)

Strategies for Change:

It is useful to consider learning and change at three levels. (Hargrove, 2003) Single loop learning involves getting better at what you already do; change is minimal e.g. improving lectures or small group discussions by providing faculty development. Double loop learning involves developing new ways of doing things but the overall goal remains the same; it is more demanding e.g. traditional lectures are replaced with team-based learning. Triple loop learning is transformative; it involves a change in mindset e.g. the clinical clerkship will be structured around a 12 month attachment to a family practice.

Several approaches can be used to bring about change:

- Faculty development is an essential component of any effective curriculum change. Faculty need opportunities to learn about the new content, new teaching and assessment methods, and new philosophies of education. It is also an important strategy to encourage “buy-in” of the new curriculum. Steinert and colleagues (2007) point out that: “For some years, it has been recognized that comprehensive faculty development programs cannot focus solely on individual improvement; they must also address the increasingly complex institutions in which teaching and learning occur.” They describe the approach used in the Faculty of Medicine at McGill University in terms of the model by J. P. Kotter (1996) for implementing change: “...establishing a sense of urgency, forming a powerful guiding coalition, creating a vision, communicating the vision, empowering others to act on the vision, generating short-term wins, consolidating gains and producing more change, and

anchoring new approaches in the culture.” (Steinert et al, 2007). Others also point out the importance of faculty development as a strategy for institutional change. (Litzelman & Cottingham, 2007; Christianson et al, 2007)

- Suchman and colleagues (2004) describe the use of an appreciative narrative-based approach to foster a social environment that embodies and reinforces the formal curriculum.

“Changing patterns of interaction across an entire medical school defies linear planning and design; we do not believe that standardized prescriptive interventions, measurements, and benchmarking will work. Instead, we have adopted the nonlinear perspective of ‘making ripples in a pond,’ envisioning our work as introducing constructive disturbances in existing patterns of interaction that other people might then adopt, modify, and propagate. We use an organizational change methodology known as appreciative inquiry, which focuses attention on existing capabilities and successful experiences as a foundation for creating more of what is desired.” (Suchman et al, 2004)

- Mowat and Mowat (2001) describe the use of action research as a strategy for change. They argue that curriculum change is difficult because “the institutional default position is always to resist change”. They suggest that those most likely to embrace change are those least invested in the status quo and current power. General practice, as a relatively new academic discipline, has ‘marginal’ status and is thus ideally positioned to broker new approaches. Action research techniques provide a feedback loop for the participants and the opportunity to make changes based on research evidence.

“It seems clear that change occurs at the margins of institutions, and that the task and challenge for general practice is to remain marginal whilst sustaining a major curricular input. The process of change is sustained by the retention of links with service practitioners who act as barometers of community needs and can translate the community and social expectations of doctors into a curriculum. Sensitivity to community and social expectation is, of course, not unique to general practitioners.” (Mowat and Mowat, 2001)

- Earp, French and Gilkey (2008) have edited an important text on patient advocacy that should be studied by all leaders in medical education. It clearly documents many of the fundamental failures of medical education and offers thoughtful and creative alternatives. One example is the teamwork between hospital planners and family members at the Medical College of Georgia in the development of a new Children’s Medical Center which opened in 1998.

“More than 20 parents and children worked with architects and hospital staff to ensure that the space provided a healing environment. ..The end result of this collaborative process was a children’s hospital with an award-winning architectural

design...As the culture shifted to this patient- and family-centered care environment, patient satisfaction benchmarks rose, with scores reaching a continuous 95th percentile and above.” (Earp, French, & Gilkey, 2008)

Restrictions on visiting hours were changed – instead of asking family members to leave during nurse shift changes; they were welcomed and consulted for their observations as “experts” in their children’s lives. Having family members present more often meant that students became more comfortable interviewing and examining children in their presence and learned to ask for their opinions and concerns and share their findings – they developed a more family-oriented approach to care.

- Rachel Naomi Remen, trained as a pediatrician, observes that medicine is a “marginalizing experience” with its emphasis on objectivity which cuts us off from our patients and from one another and renders us vulnerable to burnout. To address these wounding aspects of medical training, she suggests, we need to change the culture:

“Every culture has its shadow, and represses the wholeness of its people in some way. It persuades us to diminish ourselves, by disapproving of certain parts of our wholeness. It is a very natural thing to give up wholeness for approval. We don't even realize we're doing this, though we do it all the time in a lot of relationships and within the culture. Until fairly recently, our culture edited people very severely – the heart, the soul, the intuition were not acceptable; all that was respected was the intellect, the facts...So how do you heal the shadow of the medical culture? What occurred to me is that as culture wounds, so culture can heal. You heal a dominant culture by forming a subculture of credible people, in the middle of it, who value something new, who reinforce and reward something that the dominant culture represses.” (Remen in Lerner & Warshall, 2000)

Remen describes how she works with students, residents and faculty to reconnect them to the mysteries and meaning of medical practice using creative approaches such as ritual, imagery, drawing, and laying on of hands.

Topics Given Too Little Attention in Existing Medical School Curricula:¹

Despite some hopeful signs of improvement in many medical schools (see Appendix I), there are still several important topics that receive too little attention:

¹ See also Weston W: What We Bring. In Woollard R (editor): *The Present and the Promise of Family Medicine in Undergraduate Education: Generalist Foundations: A Discussion Paper*. Toronto: Section of Teachers of Family Medicine, College of Family Physicians of Canada, 2000.

- Physicianship
 - Being a healer
 - Mindfulness and self-knowledge (Epstein, 1999; Longhurst, 1988; Smith, 2005; McWhinney, 1996)
 - Relationships with patients and other healthcare providers/healers
 - “Presence” – being with patients in a deeply meaningful way
 - Advocacy (Earp, French & Gilkey, 2008)
- Conditions seen primarily in the community and not in tertiary care hospitals
- Clinical reasoning – especially how to approach undifferentiated problems before patients have been sorted and sent to a specific specialty clinic
- Clinical judgment – integrating patient preferences and values with clinical excellence and best research evidence to arrive at optimal management plans
- Medically unexplained symptoms and functional disorders (Wileman, May, Chew-Graham, 2002)
- Patient’s personal experiences of being unwell
 - The nature of suffering (Cassell, 2004)
 - Living with chronic disease (Toombs, Bernard, Carson, 1995)
 - Coping strategies & how to help (A Frank, 1991)
- Communication skills – verbal and non-verbal. Although taught well in the first two years, these skills deteriorate during the clerkship because of lack of reinforcement. “...students and residents seem to feel less prepared than ever for difficult situations with patients, and patients are becoming less satisfied with physician communication skills.” (Headly, 2007)
- Complex co-morbidity
- POEMS (Patient-oriented Evidence that Matters e.g. treatment X reduces morbidity and mortality) vs. DOES (Disease-oriented Evidence e.g. treatment Y improves lab results)
- Interprofessional collaboration, teamwork, leadership, and effective “followership” (Greiner & Knebel, 2003)
- Caring for dying patients & their families
- Common dental problems
- Complementary and alternative medicine
- Wellness , health and prevention including the “worried well”
- The community as patient – common social problems and the social responsibility of physicians (Popay et al, 2007; Taylor et al, 2003)

The Clinical Clerkship:

Clinical experiences are the most important component of medical education – these are the experiences that transform students into physicians. It is primarily during clerkship that students have opportunities for “trying on possible selves” where they gain a sense of fit between themselves and each specialty by projecting themselves into hypothetical career and personal roles. (Burack et al, 1997) This highlights the value of the relationship between student and teacher and the importance of

working with physicians who represent the kind of physicians that most students will become – family physicians, general specialists and community-based specialists.

Although there have been many innovations and improvements in the educational experiences in the first two years of medical school, the clinical clerkship has remained more or less unchanged for the past 40 years until recently. A number of pressures on the clerkship are creating challenges:

- The traditional “Flexnerian 2+2” curriculum design separated the learning of basic sciences in the first two years from the learning of clinical medicine in the second two years. This approach ignored what we now know about *transfer of learning* from the classroom setting to the clinical context. Transfer – learning something in one situation and then applying it to another situation – does not happen easily. Unless students have an opportunity to relate what they learn about pathophysiology in the classroom to the clinical context, they will have a difficult time integrating these basic science concepts with their clinical application. “Teaching physiology in isolation is like teaching the complete physical examination in isolation, or for that matter, like teaching the Latin course in isolation. Unless students actively apply the concepts they are learning to understanding and explaining clinical problems, the knowledge will remain inert and will be soon forgotten.” (Norman, 2007) It is not surprising that students and clinical faculty both report that, in clerkship, students have trouble remembering what they were taught in the first two years. Students sometimes report that it’s like starting medical school all over again – reformatting what they learned in classrooms to make it fit the clinical context.
- A 30% increase in student enrolment in medical schools in recent years has exceeded the capacity of many schools to provide adequate clinical experiences locally thus necessitating the use of distributed sites and all the challenges associated with such expansion e.g. faculty development, leadership and governance.
- University teaching hospitals have become inappropriate sites for undergraduate education because of acuity, short stays, patient demographics, and workload. Most hospital wards have become more like intensive care units for critically ill patients. They are highly atypical of illness in the community where most patients receive care. Unless students have an opportunity to spend time in community hospitals and physicians’ offices, they will not experience the role that most physicians fulfill in medical care.
- Clinical teachers – both faculty and residents – have become too busy with academic demands and patient care to teach well.
- The accreditation standards (especially ED-2) demand more attention to the content of the clinical experiences. No longer is it acceptable to depend on “whatever comes through the door”; the clinical curriculum must be structured to assure that students have exposure to the core content of each discipline. This means that alternative learning opportunities must be provided to address those clinical topics that are not encountered in the clinical settings.
- Medical school budgets do not provide adequate compensation to clinical faculty to permit protected time for teaching.

- Lack of educational continuity. The typical clerkship consists of a series of disconnected clinical rotations varying in length from 2 – 8 weeks in each setting. Clinical supervisors are on service for short periods of time and have little opportunity to get to know the students. As soon as students get comfortable with their role on one service, it is time to move on to the next. It often leaves students exhausted and overwhelmed. (Irby, 2007; O'Brien, Cooke & Irby, 2007)
- Failing or faltering students are not offered the additional guidance and support they need.

As a result of these pressures, medical schools have recently focused their attention on the educational issues in the clerkship.

“If students are to be provided with the kinds of experiences that will allow them to gain an appreciation of what it means to be a doctor in the 21st century, they must be assigned primarily to clinical venues in which they will encounter patients in the settings in which doctor-patient interactions usually occur. Accordingly, the clinical education of medical students should de-emphasize inpatient experiences in tertiary and quaternary hospitals and emphasize the following types of patient encounters: (1) patients seeking care for acute events and chronic illness in emergency departments and community health centers; (2) experiences in following patients discharged from the hospital to their homes, nursing homes, and hospice centers, so students gain an understanding of, and appreciation for, the challenges patients face when they return to their home and community; (3) ambulatory based, longitudinal patient care experiences that emphasize the care of patients with chronic illness; and (4) longitudinal contact with a "medical practice" group of patients so that students can gain a meaningful understanding of the importance of the doctor-patient relationship that only comes from repetitive interactions with patients over time.”
(Whitcomb & Nutter, 2002)

Learning the clinical method:

It is primarily through their clinical experiences that students begin to think like physicians. Although all physicians share common features of the clinical method, each discipline has its unique characteristics. One example is the distinctive approach to the clinical method in family medicine. Family medicine represents an approach to patients, which is open-ended and not delimited by discipline: the commitment is to the patient, not to a body of knowledge. Anything the patient wants to talk about is relevant. Caring and compassion are essential elements of the method. (Stewart et al, 2003; McWhinney, 1997; Cassell, 1997)

The task of isolating a biomedical cause of a patient's suffering is worlds apart from the task of understanding the patient's experience of being ill. The first demands the ability to sift through the patient's personal story of illness, discard all that makes the patient's narrative unique, find what is universal, and categorize the disease. The second requires physicians to steep themselves in the experiences of their patients in a very personal way, to understand their patients' feelings and individual frames of reference. The first task requires physicians to ask questions such as: where does it hurt, when did it start, what makes

it better or worse? The second task requires physicians to seek an understanding by asking: how is the illness disrupting your life, why do you think the illness is happening, why now, how do you feel about the experience, how are you coming to terms with it? These questions are especially relevant to patients with a terminal illness or a chronic disabling condition. The first set of questions is neutral, detached, and “objective” while the second set is more personal and involved, more like the questions one asks while interpreting a poem. In *The Death of Ivan Ilyich*, Tolstoy contrasts these two ways of looking at illness:

“To Ivan Ilyich only one question was important: Was his case serious or not? But the doctor ignored that misplaced inquiry. From the doctor’s point of view it was a side issue not under consideration: the real business was the assessing of probabilities...It was not a question of Ivan Ilyich’s life or death but one between a floating kidney or appendicitis... All the way home he kept going over what the doctor had said, trying to translate all those involved, obscure, scientific phrases into plain language and find in them an answer to the question: Am I in a bad way – a very bad way – or is it nothing at all?” (Tolstoy, 1960)

These two modes of comprehending our patients’ problems are vastly different and perhaps require us to use opposite cerebral hemispheres. It is not easy to integrate these two modes of understanding, and perhaps this is why we still have different models of medicine – there is no straightforward synthesis of the two. Physicians need years of experience to integrate these two approaches into their clinical method. First-year medical students seem quite skilled at comprehending a patient’s point of view. But after one or two years, they become preoccupied with disease and concerned with missing something serious. As a result, their interviews become very doctor-centered. Only later, near the end of residency training, do they begin to strike a balance.

Marinker introduces us to one of his patients, Hilda Thomson, to help us understand the unique clinical method of the general/family practitioner:

“The problem of choice in medical diagnosis is akin to the problem of choice in art or poetry. Statements in art contain many truths which do not compete with one another in the way that scientific formulations compete. Of course the dispute between rheumatoid arthritis, tuberculous arthritis and gouty arthritis, must be resolved in the diagnosis of Hilda Thompson’s painful wrist. But we do not need similarly to resolve the images of her anger towards her husband, her resentment of society, her sexual frustration, her rejection of medication, or her anxieties as a shopkeeper, in the same way. Nor do these images compete with the pathologies of her joints or of her husband’s coronary arteries. The sum of all these images constitutes the approximation of a truth about Hilda Thomson’s problems.” (Marinker, 1978)

Developmental Changes in Clerkship:

Developmental issues are important in medical education but tend to be ignored until there are problems. The learning environment and teachers' expectations change dramatically when students enter the clerkship. The focus of their learning moves from basic sciences and "book learning" to experiential learning with patients on the wards and in the clinics. During this year they start to think of themselves as physicians – a remarkable, exhilarating and sometimes frightening experience. The first two years of medical school focus on the basic sciences and their application to patient care; the content of the curriculum is well structured; the students' primary responsibility is to learn the material in courses and demonstrate that learning on the exams. But all this changes in the clerkship – suddenly they are members of a clinical team caring for seriously ill patients and the "curriculum" is messy and indeterminate. Sometimes it seems there is no limit to what must be learned.

The following table outlines many of the ways in which students are changing and developing as they progress through their professional education. (Weston & Lipkin Jr., 1989; Carroll, Lipkin Jr., Nachtigall & Weston, 1995)

	From	To
Focus of Learning	Facts Knowledge Practical value	Principles Wisdom Creativity and deeper values
Approach to Learning	Passive recipient Errors are to be avoided, denied, punished Dependence Need for certainty Imitation Narrow interests Superficial concerns Amalgamate	Active agent Errors are raw material for learning Independence, interdependence Tolerance of ambiguity Originality Broad interests Deep concerns Integrate
Cognitive Style	Dualistic search for the "right" answer "Receiver of meaning" (Perry Jr., 1968)	Evolving commitments to better answers "Maker of meaning" (Perry Jr., 1968)
Personal Development	Identity formation (Erikson, 1963) Selfishness	Intimacy, early generativity (Erikson, 1963) Altruism
Professionalization	Sense of self as student Needing to prove self Few responsibilities Rescue fantasy Rugged individual	Comfortable in role of doctor Comfortable with strengths and limits Many responsibilities Good enough Team member
Concept of Medicine	A "trade" A <i>dogmatic</i> science Hierarchical relationships	A "craft" An <i>art that uses</i> science Covenantal relationships (May, 1983)

	MD as expert A job	MD also servant A “calling”
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The clerkship shapes the students into doctors who closely resemble the other physicians on the teaching teams. This process of socialization is extremely powerful and students sometimes are distressed to realize that they have become just like the doctors they previously criticized. These behaviours seem to be more “caught” than taught. Students quickly forget everything they learned in the first two years if they do not see their role models valuing these same key concepts.

It is important to keep these developmental issues in mind when teaching medical students. Their stage of development will have profound effects on how they see the world and what they can learn easily and what will be difficult for some of them. For example, students who are still at the stage of dualism – wanting the “right” answer to all their questions (Perry Jr., 1968; Weston & Lipkin Jr., 1989; Carroll et al, 1995) – will be very uncomfortable with the uncertainties of clinical practice; students who are still in the stage of identity formation will have trouble forming close relationships with patients or colleagues (Erikson, 1963).

Stress is ubiquitous in medicine and medical education. The tendency to ignore the stress and act as if it did not exist is unhelpful and unhealthy. Students need to learn more about the stresses of physicianhood and develop effective and healthy coping mechanisms. It may even help our students and young physicians to understand their patients better by looking at their own struggles. Coombs book *Surviving Medical School* (1998) should be read by all students and their teachers, and students should have opportunities to discuss these issues with each other and with their faculty.

Medical education is not just about expanding one’s knowledge base and developing skills. Medical education is a transformative experience – it changes students into doctors. We must not underestimate the impact of this transformation on the participants. It is an exciting and satisfying journey for most students but, for some, it is a frightening and difficult transition. Teachers need to be sensitive to the struggles of their students and provide timely assistance when they recognize early signs of distress. All students should have access to a mentor – a faculty member with whom they can discuss *any* concern and who will have empathy for their plight. A mentor should not be in a position to grade the student and should be aware of the multitude of resources which might be needed – family doctors, psychiatrists, social workers, financial counselors, academic advisors – and have quick access to these services. Jean Vanier speaks of the mentor as an “accompanier” and describes the importance of his own accompanier:

“He was always there when I needed him, especially when I began l’Arche. He never judged me but always accepted me and brought out the best in me. Because I was well accompanied, I was able to open up my heart. I did not keep things hidden within, where they could rot and decay. I was able to name my weaknesses and fears...The one who accompanies is like a midwife, helping us to come to life, to live more fully. But the accompanier receives life also, and as people open up to each other, a communion of hearts develops between them. They do not clutch on to each other but give life to one

another and call each other to greater freedom. So it was easy for me, in turn, to accompany other people, to trust in them, to remove some of the guilt that weighed on their shoulders, and to help them discover their value... We human beings need to walk together, encouraging each other to continue the journey of growth and the struggle for liberation, and to break through the shell of egotism that engulfs us and prevents us from realizing our full humanity." (Vanier, 1998)

New Models for the Clerkship:

Several schools around the world are experimenting with new structures for the clerkship that provide extended experiences in family or community practice. A recent review of different approaches to achieving continuity provides good arguments for considering new approaches to the clerkship:

"As applied to the core clerkship year, educational continuity subsumes two interrelated integrating forces: horizontal integration (enhancing the development of general competency by linking learning experiences between and across clinical specialties) and vertical integration (enhancing evidence-based practice by linking advances in the biomedical and clinical sciences to clinical problem solving)... In order to anchor clinical learning in caregiving, students must have relevant involvement with patients at the site and time of initial medical decision making, ideally before the diagnosis is made, and be able to follow patients for the duration of an illness episode (and beyond), ideally across care venues... Although considerable heterogeneity of clinical education is ultimately likely, and even desirable, the essential features of a new paradigm for the 21st century must include a substantive rethinking of the relationships among patients, students, and teachers and most especially the environment in which this relationship either prospers or falters. An emphasis on continuity of care, curriculum, and supervision provides a solid foundation for maintaining and enhancing an even more fundamental continuity: the continuity of idealism." (Hirsch, Ogur, Thibault & Cox, 2007)

Several landmark programs have been very successful, some for over 30 years:

- In 1971, the University of Minnesota introduced the Rural Physician Associate Program (RPAP) for third year medical students to live and train in rural communities for nine months. Over 1000 students have participated in the program and two out of three former students practice in rural locations and four out of five are in primary care. (For more information, see <http://www.med.umn.edu/RPAP/about.html>. Accessed November 27, 2007)
- In 1972 the WAMI program (now the WWAMI program) was launched from the University of Washington School of Medicine to provide access to training for students in Washington, Wyoming, Alaska, Montana and Idaho. Much of the education occurs in rural communities and almost 50% of graduates choose a career in primary care. (For more details see <http://www.uwmedicine.org/Education/WWAMI/>. Accessed November 27, 2007)
- In 1974 Jefferson Medical College in Pennsylvania established the Physician Shortage Area Program (PSAP). Selectively admitting a small number of applicants who are most likely to become rural physicians and providing them with special support throughout medical school resulted in an increased output of rural physicians from that school. Although PSAP graduates account for only 1%

of all graduates in Pennsylvania, they represent 21% of rural family physicians in the state. (Rabinowitz, Diamond, Markham & Hazelwood, 1999; Rabinowitz, 2004)

- In 1997 Flinders University in Australia developed Full year Parallel Rural Community Curriculum (PRCC) Programs. (Worley, Silagy, Prideaux, Newble & Jones, 2000) (For more information, see http://som.flinders.edu.au/FUSA/GP-Evidence/rural/education/med_stud/y3/med_stud_y3_PRCC.htm. Accessed November 27, 2007) Students performed better on the end of year exam than students in the traditional clerkship in a tertiary care hospital. (Worley, Esterman & Prideaux, 2000)
- The James Cook University's School of Medicine enrolled its first students in 2000 "with the aim of increasing the number of medical graduates who understand rural, remote, Indigenous and tropical health issues and who would subsequently choose rural (non-metropolitan) practice." (Veitch, Underhill & Hays, 2007) 64% of graduates chose internship positions in non-metropolitan areas of Queensland. "The findings support the School's contention and that of others around the world that medical education undertaken in non-metropolitan settings is the best vehicle for increasing the rural medical workforce. This study provides support for the development of regional medical schools that focus on local recruitment and health care need issues." (Veitch, Underhill & Hays, 2007)
- The Harvard Medical School – Cambridge Integrated Clerkship was initiated in 2004 at the 118 bed Cambridge Hospital. In the initial pilot study, eight students were paired with preceptors in internal medicine, neurology, obstetrics-gynecology, pediatrics, and psychiatry in the preceptors' ambulatory clinics for 5-10 hours per week or on alternate weeks for one year. Students followed a panel of patients to scheduled visits, consultations, acute care, admissions, deliveries, surgical procedures, or rehabilitation visits. In addition, each student admitted at least 15 acutely ill internal medicine patients and followed them by rounding twice a day. Students also participated in weekly case-based small-group tutorials. This curriculum design emphasized continuity – students followed a cohort of patients for up to one year and worked with the same team of educators who served as role models, mentors and supervisors. Students in the Integrated Clerkship "performed at least as well as traditional students in tests of content knowledge and skills... and they scored higher on a year-end comprehensive clinical skills self-assessment examination... They expressed more satisfaction with their curriculum and felt better prepared to cope with the professional challenges of patient care, such as being truly caring, involving patients in decision making, and understanding how the social context affects their patients." (Ogur, Hirsh, Krupat & Bor, 2007)

In another review of several studies of community-based teaching (CBT) in the clerkship compared to traditional approaches Ferenchick, Chamberlain and Alguire (2002) report:

"Comparing their community-based experience with traditional clerkship rotations, students report learning as much about disease pattern recognition and the ability to generate a differential diagnosis, and more about the management of chronic medical problems, evaluation of "hidden agenda" items, and the management of psychosocial problems. The

intrinsic rewards of community-based teaching have a significant beneficial effect on the satisfaction and sustenance CBTs and their staff experience. It promotes key elements that should make them better physicians.”

Several schools in Canada have started, or are planning, clerkships with a long block of time attached to a family practice e.g. University of British Columbia, Sherbrooke, Northern Ontario School of Medicine, and the Universities of Alberta and Calgary. (Kondro, 2006) The opportunity to participate in a family practice for an extended block of time will allow students to appreciate the intellectual stimulation and personal rewards of family medicine as a career. It is likely that this will encourage larger numbers of students to choose a career in family medicine thus addressing the social responsibility of medical schools to produce the right numbers of the right kinds of physicians. In addition, the studies of these alternate approaches have consistently shown that student learning is enhanced by continuity of experience in community practices.

The Need for Fundamental Change:

Typically, curriculum renewal involves the introduction of new topics and new approaches to teaching and assessment but it rarely involves changing the underlying philosophy of education.

Many of the reports on medical education in recent years point out a mismatch between what our graduates need to know and what we teach them. But even more serious is the persistence of an outmoded model of medicine that still dominates the curriculum. Marinker and Bloom challenge us to make fundamental changes. They argue that the deficiencies in medical education cannot be corrected simply by doing what we do better – we must rethink the goals, purposes and worldview of our academic mission:

“The appearance of departments of general practice in the medical school has been largely a political victory; it has changed nothing. It has not created an educational shift because such a shift would require not simply a modification of the production line, nor even a general agreement by the curriculum committee on a new type of product – a different style of doctor. It would require a change in the first industrial revolution concept of the medical school as a factory.” (Marinker, 1981)

“One can speculate further that the new physicians, overwhelmed, look for a protected area of the profession where they can feel that they have reasonable control over their work life. The choice is clearly tending away from people-centered practice and toward the role of technical specialist. If this observation is accurate, the explanation is not to be found in the motivation or in the selection of recruits to the profession. It is present in the structure of the situation of modern medicine and in the structure of its major institutions. That is where change must occur if we are not content with the way things are.” (Bloom, 1988)

Such changes will represent a paradigm shift for medical education. Family medicine, as the “new kid on the academic block”, can offer fresh insights about how to make the necessary changes to bring medical education into the 21st century.

Recommendations:

Medical education has not kept pace with the accelerating changes in medicine over the past decade. Books, journal articles, and reports from numerous organizations offer a dizzying number of recommendations for change. The status quo is not sustainable. Most curricular changes in the past have been first or second order changes – either doing the same thing better or developing new ways to achieve the same goals. What we need now is third order change – a transformation of medical education and rethinking of our goals as well as our methods.

Guiding Principles for the Curriculum as a Whole:

1. The goal of the undergraduate medical curriculum is to prepare physicians for postgraduate education who are competent to provide, under appropriate supervision, expert and compassionate care to individuals in the context of their family and community and to meet their broader responsibilities to society as reflected in the expectations of the public including medical expert, communicator, collaborator, health advocate, learner, manager (“gatekeeper”), scholar, and ‘physician as person’. (Neufeld et al, 1998; Maudsley et al, 2000)
2. Generalist faculty (family physicians, general internists, general surgeons and general pediatricians) should have a central role in teaching in all years of the curriculum especially such topics as: clinical reasoning, integration and application of basic science knowledge with its clinical relevance, communication skills, health promotion, professionalism, community health, the family and community context of illness, inter-professional teamwork, the role of healing, and the centrality of the patient-physician relationship. Family physicians’ key role must be demonstrated by assuring the appropriate presence of family physicians in all years and all aspects of the curriculum so that students will appreciate the role and relevance of family physicians.
3. The curriculum should continue to teach and explore the best features of the biomedical approach to human disease but must also go beyond this limited paradigm to address those features of human illness and suffering that are best understood with a more comprehensive patient-centred approach. Family Physicians and other generalists are particularly skilled at presenting this approach.
4. It is essential to address the hidden curriculum (informal curriculum, culture of the medical school) so that it supports the goals of the evolving formal curriculum. Schools should strive to create a culture of mutual respect for all healthcare professionals and patients.
5. The curriculum should be sensitive and responsive to the developmental needs of students, especially during the transformative experiences of the clerkship, by strengthening the teacher-learner relationship and providing mentors and other support as needed.
6. Faculty at all sites should participate in an ongoing program of educational development, have adequate protected time for teaching and be appropriately compensated for their educational responsibilities. This includes full-time and part-time or adjunct faculty including community preceptors and faculty in distributed sites. Clinical teachers should exemplify the physician roles expected by the public (as listed in recommendation 1).
7. The curriculum should promote mindfulness and self-awareness by faculty and students through ongoing reflection.

8. Methods of assessment should be selected so that their steering effect will enhance the goals of the curriculum.
9. Medical school outreach activities and admission policies should encourage applications from underrepresented populations – especially rural and aboriginal groups.
10. Medical schools should become Academic Health Science Networks located in distributed sites including smaller and rural communities. It is important for all sites to contribute to planning and implementation of the curriculum with no site dominating the network.
11. Face-to-face learning should be complemented by the use of teaching technologies e.g. E-learning and videoconferencing.
12. Financial, human and other resources must be provided to address the costs of teaching in community and distributed sites – including costs of facilities, technology, staffing, and remuneration for teachers.

Recommendations Regarding the Preclerkship Years:

1. The biomedical content of the curriculum should emphasize what physicians need to know in order to manage illness and reduce the burden of disease in the community. Hippocrates reminded us that “life is short and the art long”. Consequently, a medical curriculum always entails a balance between comprehensiveness and depth. Curriculum content needs to be based on a rational plan, developed by a central curriculum committee rather than chosen at the whim or special interest of each teacher. Thus topics should be selected based on:
 - a. Prevalence in the community
 - b. Seriousness
 - c. Treatability
 - d. Educational value as a unique representation of a concept
 - e. “Big ideas and enduring concepts” (Wiggins & McTighe, 2005) – ideas that are needed for deep understanding
2. The behavioural and social sciences and humanities should be taught with the same attention to academic rigour as the biomedical sciences and should be integrated with the rest of the curriculum.
3. All students need to understand the process of knowledge creation thru the scientific method and have the skills to critically review the medical literature. Opportunities need to be available for interested students to participate in research and to develop their own research skills
4. Teaching methods should be based on an evolving understanding of how people learn (Bransford, 1999; Slotnick, 1999; Slotnick, 2001) with special emphasis on approaches that enhance transfer of learning from the preclerkship years to the clerkship and beyond.
 - a. Factual overload must be eliminated to provide time for deep learning.
 - b. Teaching methods should emphasize students’ active involvement in their own learning rather than passive acquisition.
 - c. Frequent opportunities should be available, in all years of the curriculum, for students to interact with real, simulated and virtual patients to help them integrate and transfer concepts learned in preclinical courses with their clinical relevance.

- d. Shadowing and other elective experiences in a general specialist practice (general internist, surgeon or pediatrician), and longitudinal electives in family medicine lasting at least 3 months, should be available throughout first and second years.
 - e. Basic and clinical faculty should collaborate in developing realistic case scenarios to illustrate concepts learned in preclinical courses.
 - f. Adequate library and other resource material should be readily available at all learning sites.
5. Cases should be realistic and representative:
- a. Cases should represent the full range of physician providers – family physicians, general specialists and subspecialists – as well as other health professionals and address the roles and responsibilities of each
 - b. Cases should depict a full range of patient presentations.
 - c. Case content should include the personal, family and community context.
 - d. Learning issues should portray the full spectrum of issues described by the biopsychosocial model.
 - e. Cases should present physicians and other health professionals in a favourable light rather than being used as examples of poor care. They should portray mutual respect, effective collaboration and communication among all healthcare providers.
6. Medical students should have opportunities for interprofessional and intraprofessional learning – focusing on the roles and responsibilities of other members of the healthcare team and skills in inter- and intra-professional communication and collaboration. The curriculum should address issues that are common to several professions and avoid approaches that privilege one particular group.
7. The role of information technology in teaching and patient care should be critically reviewed. It should support excellent pedagogy and patient care.
8. Family physicians should have meaningful roles in curriculum design and teaching including the teaching of common biomedical conditions.

Recommendations Regarding the Clerkship:

1. The clerkship is a general professional education with the goal of preparing undifferentiated physicians to enter into any postgraduate education program. It should focus on teaching the competencies required of all physicians
2. Students should have authentic, supervised and graduated responsibility for patient care as members of a clinical team.
3. Clerkship should provide a longitudinal experience of at least 3 months duration in a single family medicine setting where students have the opportunity to develop ongoing relationships with a group of ambulatory patients and healthcare providers. Opportunities should be available to follow a group of patients including those needing:
 - e. episodic care of undifferentiated problems,
 - f. management of chronic disease
 - g. health promotion, disease prevention, and rehabilitation

- h. advocacy
4. Schools should be encouraged to develop integrated clerkships in a community practice, 12 months or more in duration.
 5. All students should have the opportunity to be involved in the care of a dying patient.
 6. Teaching teams should demonstrate exemplary care and provide rich opportunities for learning:
 - a. Students should have experiences of appropriate numbers of patients representing all age groups, both sexes, and a full spectrum of medical problems over the course of the clerkship year.
 - b. Students should be placed in environments where decisions by the team are based on an integrated consideration of: clinical judgment, patient preferences and values, and best research evidence.
 - c. Students should observe and participate in patient-centred care in which patients are included as equal partners in management decisions
 - d. All teachers involved in teaching students should participate in ongoing faculty development to enhance their teaching skills.
 - e. All sites should provide access to high quality library resources.
 - f. Students should have an opportunity to learn how to use an electronic medical record.
 - g. The teaching setting should utilize approaches to continuous quality improvement.
 7. All residents should receive ongoing training and feedback in clinical teaching skills and have opportunities to teach. Teaching should reflect the broad principles of medical education described in this paper.
 8. Students who are faltering or failing require additional resources to provide tailored remediation – a clinical learning setting that provides adequate time for reflection, direct observation by supervisors, constructive feedback and coaching, educational expertise and one-on-one mentoring.
 9. Relationship and communication skills learned in the preclinical years need to be modeled, reinforced and enhanced during the clerkship.
 10. All physician roles identified by the EFPO (Educating Future Physicians for Ontario) Project as expected by the public – medical expert, communicator, collaborator, health advocate, learner, manager ("gatekeeper"), scholar, and "physician as person) – should be taught explicitly and by example. (Neufeld et al, 1998; Maudsley et al, 2000)

References – a Selected List of Books and Articles:

The literature in this field is vast and expanding rapidly. It includes references to higher education, medical education, psychology of learning, curriculum studies, teaching, narrative, and philosophy of education. In addition, some of the seminal writings on family medicine and primary care are included.

Allen J (Editor): *The European Definition of General Practice / Family Medicine, Revised*. Barcelona, Spain: WONCA Europe, 2005. Available at <http://www.woncaeurope.org/Web%20documents/European%20Definition%20of%20family%20medicine/Definition%20nd%20ed%202005.pdf> Accessed April 12, 2008.

American Medical Association Initiative to Transform Medical Education – Recommendations for change in the system of medical education. Chicago: American Medical Association, 2007.

Anseau M, Dierick M, Buntinx F et al: High prevalence of mental disorders in primary care. *Journal of Affective Disorders*. 2004;78:49-55.

Bandura A: *Social Foundations of Thought and Action: A Social Cognitive Theory*. Prentice Hall, 1985.

Barzansky B (editor): *Beyond Flexner: Medical Education in the Twentieth Century*. New York: Greenwood Press, 1992.

Barzansky B, Friedman CP, Arnold L, Davis WK, Jonas HS, Littlefield JH, Martini CJM: A view of medical practice in 2020 and its implications for medical school admission. *Academic Medicine*. 1993;68(1):31-34.

Bevis EO, Watson J: *Toward a Caring Curriculum – A New Pedagogy for Nursing*. Toronto: Jones and Bartlett, 2000.

Bland CJ, Starnaman S, Wersal L, Moorhead-Rosenberg L, Zonia S, Henry R: Curricular Change in Medical Schools: How to Succeed. *Academic Medicine*. 2000;75:575-594.

Bloom SW: Structure and ideology in medical education: an analysis of resistance to change. *Journal of Health and Social Behavior*. 1988;29:294-306.

Bonner TN: *Iconoclast – Abraham Flexner and a Life in Learning*. Baltimore: the Johns Hopkins University Press, 2002.

Bowe CM, Lahey L, Armstrong E, Kegan R: Questioning the 'big assumptions'. Part 1: addressing personal contradictions that impede professional development. *Medical Education*. 2003;37:715-722.

Bransford JD, Brown AL, Cocking RR (editors): *How People Learn- Brain, Mind, Experience, and School*. Washington: National Academy Press, 1999.

Brown S, Knight: *Assessing Learners in Higher Education*. London: Kogan Page, 1994.

Burack JH, Irby DM, Carline JD, Ambrozy DM, Ellsbury KE, Stritter FT: A study of medical students' specialty choice pathways: trying on possible selves. *Academic Medicine*. 1997;72(6):534-541.

Calman KC: *Medical Education – Past, Present and Future – Handing on Learning*. Edinburgh: Churchill Livingstone Elsevier, 2007.

Carnegie Foundation for the Advancement of Teaching: Professional Preparation of Physicians – Medical Education Study. Available from: <http://72.5.117.129/programs/index.asp?key=1822>. Accessed November 24, 2007.

Carroll JG, Lipkin M Jr, Nachtigall L, Weston WW: A Developmental Awareness for Teaching Doctor/Patient Communication Skills. In: Lipkin M Jr, Putnam SM, Lazare A: *The Medical Interview – Clinical Care, Education, and Research*. New York: Springer-Verlag, 1995.

Cassell EJ: *Doctoring – The Nature of Primary Care Medicine*. New York: Oxford University Press, 1997.

Cassell, EJ. The Nature of Suffering and the Goals of Medicine. 2nd edition. Oxford: Oxford University Press, 2004.

Christakis NA: The similarity and frequency of proposals to reform US medical education. *JAMA*. 1995;274(9):706-711.

Christianson CE, McBride RB, Vari RC, Olson L, Wilson D: From traditional to patient-centered learning: curriculum change as an intervention for changing institutional culture and promoting professionalism in undergraduate medical education. *Academic Medicine*. 2007;82(11):1079-1088.

Clarke LE, Nisker J: *In Our Hands – On Becoming a Doctor*. Lawrencetown Beach, Nova Scotia: Pottersfield Press, 2007.

Conrad P: Learning to doctor: reflections on recent accounts of the medical school years. *Journal of Health and Social Behavior*. 1988;29(4):323-332.

Cooke M, Irby DM, Sullivan W, Ludmerer KM: American Medical Education 100 Years after the Flexner Report. *New England Journal of Medicine*. 2006;355:1339-1344.

Coombs RH: *Surviving Medical School*. Thousand Oaks: Sage, 1998.

Cuff PA, Vanselow NA (editors): *Improving Medical Education – Enhancing the Behavioral and Social Science Content of Medical School Curricula*. Washington: The National Academies Press, 2004.

Cushing A: Assessment of Non-Cognitive Factors. In Norman GR, van der Vleuten CPM, Newble DI (Editors): *International Handbook of Research in Medical Education*. Dordrech: Kluwer Academic Publishers, 2002.

Cwikel J, Zilber N, Feinson M, Lerner Y: Prevalence and risk factor of threshold and sub-threshold psychiatric disorders in primary care. *Social Psychiatry and Psychiatric Epidemiology*. 2007;11. Published online first at

<http://www.springerlink.com.proxy2.lib.uwo.ca:2048/content/1q37176123103869/fulltext.pdf>. Accessed on November 24, 2007

Davies R: *The Merry Heart*. London: Viking, 1997.

Des Marchais JE: *Learning to Become a Physician at Sherbrooke*. Maastricht: Network Publications, 2001.

Earp JAL, French EA, Gilkey MB: *Patient Advocacy for Health Care Quality: Strategies for Achieving Patient-Centered Care*. Sudbury, Massachusetts: Jones and Bartlett, 2008.

Emanuel E: Changing the Pre-med Requirements and the Medical Curriculum: Time for a Second Flexner Report. *JAMA*. 2006;296:1128-1131.

Engel GL: How Much Longer Must Medicine's Science be Bound by a Seventeenth Century World View? In: White KL: *The Task of Medicine – Dialogue at Wickenburg*. Menlo Park, California: The Henry J. Kaiser Family Foundation, 1988.

Epstein RM: Mindful Practice. *JAMA*. 1999;282:833-839.

Ericsson KA, Charness N, Feltovich PJ, Hoffman RR: *The Cambridge Handbook of Expertise and Expert Performance*. Cambridge: Cambridge University Press, 2006.

Ericsson KA, Krampe RT, Tesch-Romer C: The role of deliberate practice in the acquisition of expert performance. *Psychological Review*. 1993;100(3):363-406.

Erikson, Erik H. *Childhood and Society*. 2nd edition. New York: Norton, 1963.

Eva K: Putting the cart before the horse: testing to improve learning. *British Medical Journal*. 2007;334:535.

Evans RG, Barer ML, Marmor TR (Editors): *Why Are Some People Healthy and Others Not? The Determinants of Health in Populations*. New York: Aldine De Gruyter, 1994.

Ferenchick GS, Chamberlain J, Alguire P: Community-based teaching: Defining the Added Value for Students and Preceptors. *The American Journal of Medicine*. 2002;112:512-517. Available from <http://www.im.org/facdev/gimfd/ProjectMaterial/PublicationsReportsfiles/AlguireFerenchickChamberlain.pdf>. Accessed November 24, 2007.

Flexner A: *Medical Education in the United States and Canada*. Bulletin No. 4. New York: Carnegie Foundation for the Advancement of Teaching. 1910.

Flexner A: *Medical Education in the United States and Canada*. New York: The Carnegie Foundation for the Advancement of Teaching, 1910. Available from: <http://www.carnegiefoundation.org/publications/>. Accessed November 24, 2007.

Flexner A: *Medical Education: A Comparative Study*. New York: MacMillan, 1925.

Frank A: *At the Will of the Body – Reflections on Illness*. Boston: Houghton Mifflin, 1991.

Frank JR (Editor): *The CanMEDS 2005 Physician Competency Framework – Better standards. Better physicians. Better care*. Ottawa: The Royal College of Physicians and Surgeons of Canada, 2005. Available from: <http://rcpsc.medical.org/canmeds/CanMEDS2005/index.php>. Accessed December 5, 2007.

Frank JR, Jabbour M, Tugwell P, et al: Skills for the new millennium: report of the societal needs working group, CanMEDS 2000 Project. *Annals of the Royal College of Physicians and Surgeons of Canada*. 1996;29:206-216.

Gambrill E: *Critical Thinking in Clinical Practice – Improving the Quality of Judgments and Decisions*. 2nd Edition. Hoboken, New Jersey: John Wiley and Sons, 2005.

Genn JM: AMEE Medical Education Guide No. 23 (Part 1): Curriculum, environment, climate, quality and change in medical education – a unifying perspective. *Medical Teacher*. 2001;23(4):337-344.

Genn JM: AMEE Medical Education Guide No. 23 (Part 2): Curriculum, environment, climate, quality and change in medical education – a unifying perspective. *Medical Teacher*. 2001;23(5):445-454.

Green LA, Yawn BP, Lanier D, Dovey SM: The Ecology of Medical Care Revisited. *New England Journal of Medicine*. 2001;344(26):2021-2025.

Greenhalgh T, Hurwitz B (Editors): *Narrative Based Medicine – Dialogue and Discourse in Clinical Practice*. London: BMJ Books, 1998.

Greenhalgh T, Hurwitz B: Narrative based medicine: why study narrative? *British Medical Journal*. 1999;318:48-50

Greenhalgh T: *Primary Health Care – Theory and Practice*. Oxford: Blackwell Publishing, 2007.

Greiner AC, Knebel E (Editors): *Health Professions Education: A Bridge to Quality*. Washington: The National Academies Press, 2003

Groopman J: *How Doctors Think*. New York: Houghton Mifflin, 2007.

Gunderman RB: *Achieving Excellence in Medical Education*. New York: Springer, 2006.

Hafferty FW: Cadaver stories and the emotional socialization of medical students. *Journal of Health and Human Behavior*. 1988;29(4):344-356.

Hafferty FW, Franks R: The hidden curriculum, ethics teaching, and the structure of medical education. *Academic Medicine*. 1994;69:861-871.

Hafferty FW: Beyond curriculum reform: confronting medicine's hidden curriculum. *Academic Medicine*. 1998;73:403-407.

- Hargrove R: *Masterful Coaching*. Revised Edition. San Francisco: Jossey-Bass, 2003.
- Hart JT: The world turned upside down: proposals for community based undergraduate medical education. *Journal of the Royal College of General Practitioners*. 1985;35:63-68.
- Hawkins AH: Pathography: patient narratives of illness. *Western Journal of Medicine*. 1999;171:127-129.
- Headly A: Communication Skills: A Call for Teaching to the Test. APM Perspectives. *The American Journal of Medicine*. 2007;120(10):912-915. Available from <http://www.im.org/AAIM/Pubs/Docs/AJM/2007/October07Perspectives.pdf>. Accessed November 24, 2007.
- Heyrman J (Editor): *The Euract Educational Agenda of General Practice / Family Medicine*. Kos, Greece: WONCA, 2005. Available at <http://www.euract.org/pdf/agenda.pdf> Accessed April 12, 2008.
- Hirsch DA, Ogur B, Thibault GE, Cox M: "Continuity" as an organizing principle for clinical education reform. *New England Journal of Medicine*. 2007;356(8):858-866.
- Iedema R, Degeling P, Braithwaite J, Chan D: Medical Education and Curriculum Reform Proposals in Context. *Medical Education Online*. 2004;9:17.
- Inui TS: *A Flag in the Wind: Educating for Professionalism in Medicine*. Washington, D.C.: Association of American Medical Colleges, 2003.
- Irby D: Educational Continuity in Clinical Clerkships. *New England Journal of Medicine*. 2007;356(8):856-857.
- Irby DM, Wilkerson L: Educational Innovations in Academic Medicine and Environmental Trends. *Journal of General Internal Medicine*. 2003;18:370-376.
- Isaacs SL, Knickman JR (editors): *Generalist Medicine and the U.S. Health System*. San Francisco: Jossey-Bass, 2004.
- Jolly B, Rees L: *Medical Education in the Millennium*. Oxford: Oxford Medical Press, 1998.
- Jonas S: *Medical Mystery – the Training of Doctors in the United States*. New York: WW Norton, 1978.
- Jones R, Britten N, Culpepper L, Gass D, Grol R, Mant D, Silagy C: *Oxford Textbook of Primary Medical Care*. Oxford: Oxford University Press, 2004.
- Kern DE, Thomas PA, Howard DM, Bass EB: *Curriculum Development for Medical Education – A Six-Step Approach*. Baltimore: The Johns Hopkins University Press, 1998.
- Kondro W: Eleven satellite campuses enter orbit of Canadian medical education. *Canadian Medical Association Journal*. 2006;175(5):461-462.
- Kotter JP: *Leading Change*. Boston, Massachusetts: Harvard Business School Press, 1996.

Lakhani M (editor): *A Celebration of General Practice*. Abingdon, Oxon: Radcliffe Medical Press, 2003.

Lempp H, Seale C: The hidden curriculum in undergraduate medical education qualitative study of medical students' perceptions of teaching. *British Medical Journal*. 2004;329:770-773.

Lerner MJ, Warshall P: The Doctor's Dilemma – ethics in doctor-patient relations. Returning service, grace, and meaning to the art of healing. Rachel Naomi Remen – an interview with Peter Warshall. *Whole Earth*. Summer 2000. Available from http://articles.findarticles.com/p/articles/mi_m0GER/is_2000_Summer/ai_63500736. Accessed December 2, 2007.

Lipkin M: *The Care of Patients. Perspectives and Practices*. New Haven: Yale University Press, 1987.

Litzelman DK, Cottingham AH: The new formal competency-based curriculum and informal curriculum at Indiana University School of Medicine: overview and five-year analysis. *Academic Medicine*. 2007;82:410-421.

Longhurst M: Physician self-awareness: the neglected insight. *Canadian Medical Association Journal*. 1988;139:121-124.

Ludmerer KM: *Learning to Heal: The Development of American Medical Education*. Baltimore: The Johns Hopkins University Press, 1996.

Ludmerer KM: *Time to Heal – American Medicine from the Turn of the Century to the Era of Managed Care*. Oxford: Oxford University Press, 1999.

Margolis E (Editor): *The Hidden Curriculum in Higher Education*. New York: Routledge, 2001.

Marinker M: Medical education and human values. *Journal of the Royal College of General Practitioners*. 1974;24:445-462.

Marinker M: Myth, paradox and the hidden curriculum. *Medical Education*. 1997;31:293-298.

Marinker M: Should general practice be represented in the university medical school. *British Medical Journal*. 1983;286:855-859.

Marinker M: The chameleon, the Judas goat, and the Cuckoo. (Yorkshire Oration 1977) *Journal of the Royal College of General Practitioners*. 1978;28:199-206.

Martin JB et al: *Educating Doctors to Provide High Quality Medical Care: A Vision for Medical Education in the United States – Report of the Ad Hoc Committee of Deans*. Commissioned for the AAMC Institute for Improving Medical Education, 2004.

Mathers N, Rowland S: General Practice – A PostModern Specialty? *British Journal of General Practice*. 1997;47:177-179.

Maudsley RF, Wilson DR, Neufeld VR, Hennen BK, DeVillaeer MR, Wakefield J, MacFadyen J, Turnbull JM, Weston WW, Brown MG, Frank JR, Richardson D: Educating Future Physicians for Ontario: Phase II. *Academic Medicine*. 2000;75(2):113-126.

May WF: *The Physician's Covenant: Images of the Healer in Medical Ethics*. Philadelphia: The Westminster Press, 1983.

McLachlan JC: 'My story': a new departure for Medical Education. (Editorial) *Medical Education*. 2006;40:1154-1155.

McWhinney IR: *The Early Signs of Illness – Observations in General Practice*. Springfield, Illinois: Charles C. Thomas, 1964.

McWhinney IR: The reform of medical education: a Canadian model. *Medical Education*. 1980;14:189-195.

McWhinney IR: The Importance of Being Different. The William Pickles Lecture 1996. *British Journal of General Practice*. 1996;46:433-436.

McWhinney IR: *A Textbook of Family Medicine* 2nd edition. Oxford: Oxford University Press, 1997.

McWhinney IR: The Essence of General Practice. In Lakhani M (Editor): *A Celebration of General Practice*. Abingdon, Oxon: Radcliffe Medical Press, 2003.

McWhinney IR: The Evolution of Clinical Method. In: Stewart M, Brown JB, Weston WW, McWhinney IR, McWilliam CL, Freeman TR: *Patient-Centered Medicine – Transforming the Clinical Method*. 2nd edition. Abingdon, Oxon: Radcliffe Medical Press, 2003.

Mead N, Bower P: Patient-centredness: a conceptual framework and review of the empirical literature. *Social Science and Medicine*. 2000;51:1087-1110.

Mowat H, Mowat D: The value of marginality in a medical school: general practice and curricular change. *Medical Education*. 2001;35:175-177.

Mullan F: *Big Doctoring in America – Profiles in Primary Care*. Berkeley: University of California Press, 2002.

Murray J et al: *An External Review of the EFPO Project at the Midpoint*. November, 1992.

Neufeld VR, Maudsley RF, Pickering RJ, Turnbull JM, Weston WW, Brown MG, Simpson JC: Educating future physicians for Ontario. *Academic Medicine*. 1998;73:1133-1148.

Nooman ZM, Schmidt HG, Ezzat ES (editors): *Innovation in Medical Education – an Evaluation of Its Present Status*. New York: Springer, 1990.

Norman G: How basic is basic science? *Advances in Health Sciences Education*. 2007;12:401-403.

Norman GR, van der Vleuten CPM, Newble DI (Editors): *International Handbook of Research in Medical Education*. Dordrech: Kluwer Academic Publishers, 2002.

O'Brien B, Cooke M, Irby D: Perceptions and attributions of third-year student struggles in clerkships: do students and clerkship directors agree? *Academic Medicine*. 2007;82(10):970-978.

Ofri D: *Singular Intimacies – Becoming a Doctor at Bellevue*. Boston: Beacon Press, 2003.

Ogur B, Hirsh D, Krupat E, Bor D: The Harvard Medical School-Cambridge Integrated Clerkship: An Innovative Model of Clinical Education. *Academic Medicine*. 2007;82:397-404.

Oswald N, Alderson T, Jones S: Evaluating primary care as a base for medical education: the report of the Cambridge Community-based Clinical Course. *Medical Education*. 2001;35:782-788.

Palmer PJ: A New Professional – The Aims of Education. *Change*. 2007;39(6). Available from <http://www.carnegiefoundation.org/change/sub.asp?key=98&subkey=2455>. Accessed November 24, 2007.

Palomba CA, Banta TW: *Assessment Essentials – Planning, Implementing, and Improving Assessment in Higher Education*. San Francisco: Jossey-Bass, 1999.

Papa FJ, Harasym PH: Medical Curriculum Reform in North America, 1765 to the Present: A Cognitive Science Perspective. *Academic Medicine*. 1999;74:154-164.

Patients as Advisors: Enhancing Medical Education Curricula. Available from: <http://www.usuhs.mil/med/patientadvisors.html> . Accessed November 24, 2007

Pauli HG, White KL, McWhinney IR: Medical Education, Research, and Scientific Thinking in the 21st Century (Part One). *Education for Health*. 2000;13(1):15-25.

Pauli HG, White KL, McWhinney IR: Medical Education, Research, and Scientific Thinking in the 21st Century (Part Two). *Education for Health*. 2000;13(2):165-172.

Pauli HG, White KL, McWhinney IR: Medical Education, Research, and Scientific Thinking in the 21st Century (Part Three). *Education for Health*. 2000;13(2):173-186.

Perry Jr. WG: *Forms of Intellectual and Ethical Development in the College Years – A Scheme*. New York: Holt, Reinhart and Winston, 1968.

Peters AS, Feins A, Rubin R, Seward S, Schnaidt K, Fletcher RH: The Longitudinal Clerkship at Harvard Medical School. *Academic Medicine*. 2001;76:484-488.

Phillips WR, Haynes DG: The domain of family practice: scope, role, and function. *Family Medicine*. 2001;33(4):273-277.

Popay J, Kowarzik U, Mallinson S, Mackian S, Barker J: Social problems, primary care and pathways to help and support: addressing health inequalities at the individual level. Part I: the GP perspective. *Journal of Epidemiology and Community Health*. 2007;61:966-971.

Popay J, Kowarzik U, Mallinson S, Mackian S, Barker J: Social problems, primary care and pathways to help and support: addressing health inequalities at the individual level. Part II: lay perspectives. *Journal of Epidemiology and Community Health*. 2007;61:972-977

Postman N, Weingartner C: *Teaching as a Subversive Activity*. New York: Dell Publishing, 1969.

Rabinowitz HK, Diamond JJ, Markham FW, Hazelwood CE: A program to increase the number of family physicians in rural and underserved areas. Impact after 22 years. *JAMA*. 1999;281(3):255-260.

Rabinowitz HK: *Caring for the Country – Family Doctors in Small Rural Towns*. New York: Springer, 2004.

Reilly BM: Inconvenient truths about effective clinical teaching. *Lancet*. 2007;370:705-711.

Renaud M: The Future: Hygeia Versus Panakeia? In Evans RG, Barer ML, Marmor TR (Editors): *Why Are Some People Healthy and Others Not? The Determinants of Health in Populations*. New York: Aldine De Gruyter, 1994.

Ross RH, Fineberg HV: *Innovations in Physician Education – the Process and Pattern of Reform in North American Medical Schools*. New York: Springer, 1996.

Rosser W: Sustaining the four principles of family medicine in Canada. (Editorial). *Canadian Family Physician*. 2006;52:1191-1192.

Schmidt HG, Lipkin Jr. M, de Vries MW, Greep JM (editors): *New Directions for Medical Education – Problem-based Learning and Community-oriented Medical Education*. New York: Springer-Verlag, 1989.

Schön DA: *Educating the Reflective Practitioner – Toward a New Design for Teaching and Learning in the Professions*. San Francisco: Jossey-Bass, 1987.

Schön DA: *The Reflective Practitioner – How Professionals Think in Action*. New York: Basic Books, 1983.

Slotnick HB: How doctors learn: physicians self-directed learning episodes. *Academic Medicine*. 1999;74(10):1106-1117.

Slotnick HB: How doctors learn: education and learning across the medical-school-to-practice trajectory. *Academic Medicine*. 2001;76(10):1013-1026.

Smith RC, Dwamena FC, Fortin VI AH: Teaching personal awareness. *Journal of General Internal Medicine*. 2005;20:201-207.

Stange KC, Miller ML, McWhinney IR: Developing the knowledge base of family practice. *Family Medicine*. 2001;33(4):286-297.

Stein J (Editor in Chief): *The Random House Dictionary of the English Language*. The Unabridged Edition. New York: Random House, 1966.

Steinert Y, Cruess RL, Cruess SR, Boudreau JD, Fuks A: Faculty development as an instrument of change: a case study on teaching professionalism. *Academic Medicine*. 2007; 82(11):1057-1064.

Stewart M, Brown JB, Weston WW, McWhinney IR, McWilliam CL, Freeman TR: *Patient-Centered Medicine – Transforming the Clinical Method*. 2nd edition. Abingdon, Oxon: Radcliffe Medical Press, 2003.

Sturmberg JP, Reid A, Khadra MH: Community Based Medical Education in a Rural Area: A New Direction in Undergraduate Training. *Australian Journal of Rural Health*. 2001;9(supplement):S14-S18.

Sturmberg JP: *The Foundations of Primary Care – Daring to be Different*. Oxford: Radcliffe Publishing, 2007.

Suchman AL, Williamson PR, Litzelman DK, Frankel RM, Mossbarger DL, Inui TS, and the Relationship-centered Care Initiative Discovery Team: Toward an informal curriculum that teaches professionalism – transforming the social environment of a medical school. *Journal of General Internal Medicine*. 2004;19:501-504.

Sweeney B: The Place of the Humanities in the Education of a Doctor. *British Journal of General Practice*. 1998;48:998-1102.

Takakuwa KM, Rubashkin N, Herzig KE (Editors): *What I Learned in Medical School – Personal Stories of Young Doctors*. Berkeley: University of California Press, 2004.

Taylor RJ, Smith BH, van Teijlingen ER: *Health and Illness in the Community – An Oxford Core Text*. Oxford: Oxford University Press, 2003.

The Panel on the General Professional Education of the Physician: *Physicians for the Twenty-First Century – the GPEP Report*. Washington: Association of American Medical Colleges, 1984.

Tolstoy L: *The Death of Ivan Ilych and Other Stories*. London: Penguin Books, 1960.

Toombs SK, Barnard D, Carson RA: *Chronic Illness – From Experience to Policy*. Bloomington: Indiana University Press, 1995.

Towle A, Weston W: Patient's voice in health professional education. Editorial. *Patient Education and Counseling*. 2006;63(1-2):1-2.

Vanier J: *Becoming Human*. Toronto: House of Anansi, 1998.

Veitch C, Underhill A, Hays RB: The career aspirations and location intentions of James Cook University's first cohort of medical students: a longitudinal study at course entry and graduation. *Rural and Remote Health*. 2006;6:537. Available at <http://www.rrh.org.au/articles/showarticlenew.asp?ArticleID=537>. Accessed November 24, 2007.

- Wade V, Silagy C, Mahoney S: A prospective randomized trial of an urban general practice attachment for medical students. *Medical Education*. 1998;32:289-293.
- Waitzkin H: *The Politics of Medical Encounters – How Patients and Doctors Deal with Social Problems*. New Haven: Yale University Press, 1991.
- Weston W: The Person: A Missing Dimension in Medical Care & Education. *Canadian Family Physician*, 1988; 34:1701-1705, 1803.
- Weston WW, Lipkin M Jr: Doctors Learning Communication Skills: Developmental Issues. In: Stewart M, Roter D: *Communicating with Medical Patients*. Newbury Park, CA: Sage Publications, 1989.
- Where's the Patient's Voice in Health Professions Education? Available from: <http://www.health-disciplines.ubc.ca/DHCC/moodle/>. Accessed November 24, 2007
- White KL: *The Task of Medicine – Dialogue at Wickenburg*. Menlo Park, California: The Henry J. Kaiser Family Foundation, 1988.
- Whitcomb ME, Nutter D: *Learning Medicine in the 21st Century – A Background Paper* commissioned in 2002 for Carnegie's medical education study. Available from: <http://72.5.117.129/programs/sub.asp?key=1822&subkey=2298&topkey=1822>. Accessed November 24, 2007.
- Whitcomb ME: Medical Education Reform: Is It Time for a Modern Flexner Report? *Academic Medicine*. 2007;82(1):1-2.
- Whitcomb ME: The General Professional Education of the Physician. *Academic Medicine*. 2006;81(12):1015-1016.
- White KL, Greenberg BG: The Ecology of Medical Care. *New England Journal of Medicine*. 1961;265:885-892.
- Wiggins G, McTighe: *Understanding by Design*. Expanded 2nd Edition. Alexandria, Virginia: Association for Supervision and Curriculum Development, 2005.
- Wileman L, May C, Chew-Graham C: Medically unexplained symptoms and the problem of power in the primary care consultation: a qualitative study. *Family Practice – an International Journal*. 2002;19;(2):178-182.
- Wilkes MS, Hoffman JR, Usatine R, Baillie S: An Innovative Program to Augment Community Preceptor's Practice and Teaching Skills. *Academic Medicine*. 2006;81:332-341.
- Wilson R, Shortt SED, Dorland J (editors): *Implementing Primary Care Reform – Barriers and Facilitators*. Montreal and Kingston: McGill-Queen's University Press, 2004.

Woollard R (editor), Weston W, Freeman R, Brenneis F, MacLean C, Turner G, Lehmann F: *The Present and Promise of Family Medicine in Undergraduate Education: Generalist Foundations: A Discussion Paper*. Section of Teachers of Family Medicine, College of Family Physicians of Canada, 2000.

Worley P, Esterman A, Prideaux D: Cohort study of examination performance of undergraduate medical students learning in community settings. *British Medical Journal*. 2004;328:207-209.

Worley P, Silagy C, Prideaux D, Newble D, Jones A: The Parallel Rural Community Curriculum: an integrated clinical curriculum based in rural general practice. *British Medical Journal*. 2000;34:558-565.

Wykurz G, Kelly D: Developing the role of patients as teachers: literature review. *British Medical Journal*. 2002;818-821.

Young A: *What Patients Taught Me – A Medical Student's Journey*. Seattle: Sasquatch Books, 2004.

A ppendix I - Recent Trends in Medical Education – Some Hopeful Signs of Improvement:

The following list of improvements is encouraging – medical schools have come a long way in recent decades. But we are not there yet. Not all schools have made all of these changes and most schools have not gone far enough. In particular, the clerkship still emphasizes an outdated biomedical model which undoes many of the improvements in the preclerkship years.

- Changes in *who* we teach:
 - Admission criteria are changing – more flexible requirements at some schools (e.g. accepting students with a predominantly arts background); more demanding requirements from others (e.g. requiring a four year honor degree for admission); new approaches from some schools (e.g. admitting students after 2 years of university education)
 - Students in combined degree programs e.g. MD/PhD programs
 - Women students are being admitted to medical schools in larger numbers than ever before
 - The student body represents a wide diversity of ethnocultural backgrounds
 - Medical school enrolment in Canada has increased by approximately 30% in the past few years
- Changes in *how* we teach:
 - Over the past two decades, medical schools have introduced many important changes that enhance transfer. Lecture-based teaching has been reduced to allow more time for small group discussions and exercises organized around clinical cases. Most medical schools offer Earlier and greater involvement with patients throughout the first two years for students to gain some insights into the nature of clinical practice and the relevance of the basic sciences they are learning. In addition, most schools provide formal instruction in clinical skills – interviewing and physical examination.
 - Most schools have changed from a department-controlled or discipline-specific curriculum structure to a more centrally-organized and integrated structure
 - Recognition of the value of a narrative understanding of illness (Clarke & Nisker, 2007; Greenhalgh & Hurwitz, 1999; Hawkins, 1999; Mclachlan, 2006; Ofri, 2003; Young, 2004; Takakuwa et al, 2004)
 - “New” teaching methods – PBL, Team-based teaching (TBL), the Case Method
 - Developing approaches to interprofessional education
 - New ways to use technology to enhance learning:
 - Web-based instructional material
 - Computerized simulations for learning procedures and for learning clinical reasoning skills
 - Computer-based virtual reality e.g. for learning anatomy
 - Virtual patients
 - Skills labs for learning procedural skills
- Changes in *where* we teach:

- Distributed education. By 2009, 250 students will be enrolled at 11 regional campuses across Canada. (Kondro, 2006)
 - Regional campuses for clinical learning in the clerkship – either for part of the clerkship or the entire clerkship
 - Regional campuses for all four years of medical school
- More time in physician’s offices rather than the hospital
- More time in community hospitals rather than tertiary and quaternary hospitals
- More time in primary care rather than secondary or tertiary care
- “New” locations for learning – patients’ homes, hospices, nursing homes, community healthcare resources and shelters including the homeless
- Changes in *who* teaches:
 - An increasing number of faculty are seeking better preparation for their teaching roles by participating in faculty development activities. Larger numbers than ever before have obtained diplomas, certificates and Master of Education degrees. Education scholarship and research has greatly expanded in recent years and is now providing research evidence (Norman, Van der Vleuten & Newble, 2002) to guide curricular decisions
 - More teaching by family physicians
 - More teaching by allied health professionals – nurses, physiotherapists, social workers etc.
 - More teaching by patients (Wykurz & Kelly, 2002; Towle & Weston, 2006) e.g. Patient Partners, simulated patients, lay advisory groups
- Changes in *what* we teach:
 - Emphasis on seeking good evidence for all aspects of clinical care – Evidence-based Medicine (EBM)
 - Well-designed courses on clinical methods. Students have opportunities to practice specific interviewing and physical examination skills (e.g. male and female genital exam) with simulated patients.
 - Increased attention to the social determinants of health
 - Increased attention to the behavioural sciences and humanities e.g. ethical decision-making
 - Introduction of Complementary and Alternative Medicine (CAM)
 - More attention to a number of topics: population health, nutrition, genomics, cultural competence, medical errors.
 - More elective opportunities
 - Increasing recognition of the social responsibility of medical schools
 - Introduction of more formal instruction in the clerkship e.g. academic half-days

Appendix II – What’s Wrong with Medical Education?

Many recent reports in the U.S. have raised concerns about the state of medical education. Although there are significant differences in how medical education is conducted in Canada, we share many of the deficiencies identified in the U.S. system. The American Medical Association Initiative to Transform Medical Education (ITME, 2007) reviewed a number of reports and commentaries and noted a number of similarities in the gaps they identified. They have targeted the following general areas for improvement in the current preparation of physicians:

“Treating” the health care system

There are gaps in physicians’ preparation to “diagnose and treat” problems in their own health care organizations and in the health care system. This includes the ability to engage in a continuous quality improvement approach to system evaluation and improvement at a macro level (the health care system) and micro level (within their own health care organization). Specifically, physicians are not prepared to evaluate the care they provide in their own practices and to use the results to improve patient safety and the quality of care provided.

Serving as advocates for patients

Physicians are generally not prepared to be advocates for patients on issues related to social justice (for example, elimination of health care disparities, access to care) and to be citizen leaders inside and outside of the medical profession. This also includes engaging in advocacy on public health issues. [See Earp, French, Gilkey]

Losing altruism and the caring aspects of medicine

Physicians often lose altruism and qualities of caring as they proceed through training and enter the practice environment. Applicants to medical school and residency training are selected for their abilities to acquire knowledge and to problem-solve, and our current system of medical education reinforces these traits. This may lead physicians to perceive patients simply as sources of data and “problems to be solved,” instead of as individuals in need.

Dealing with uncertainty

Physicians are trained to believe it is important to have “the answer.” They are expected to convey this impression to supervisors while in training and subsequently behave this way with patients and colleagues when they are in practice. This makes it difficult for physicians to deal with the inevitable uncertainty arising from incomplete or conflicting information. Additionally, they are not typically prepared to convey their uncertainty when interacting with patients and colleagues.

Managing information

In the context of the rapidly expanding knowledge base, many physicians are not prepared to rapidly acquire, evaluate and synthesize information in the context of care for an individual patient. While there are generational differences, many physicians are not prepared to utilize information technology to assist in information acquisition and management. Further, they are not prepared to develop and carry out their own

lifelong learning curriculum, including identifying their own learning needs and establishing learning goals to meet these needs.

Expecting to be autonomous

Physicians are socialized to be “in charge” and act as autonomous decision-makers in the care of patients. This philosophy can be a barrier to providing patient-centered care, where patient values and desires are an integral part of shared decision-making. Physicians need additional preparation in balancing their own values and expectations with those of their patients, while taking into account changing societal needs and expectations.

This expectation of autonomy starkly contrasts with increasing requirements for physicians to be more accountable to various constituencies, including the public, payers and government. Physicians must continue to take a leadership role in professional self-regulation or that privilege will be threatened and diminished. Lastly, the expectation of autonomy diminishes the ability of physicians to act as team players with other physicians and other health professionals. They may be reluctant to learn from other professions and disciplines and to work with others as partners in the care process, which may hamper the care that is provided to patients.

Balancing the patient and population perspectives

Physicians are prepared to do what they believe is best for individual patients. They are not, however, prepared to participate in ethical and political discussions about the allocation of health care resources, which are not limitless.

Exercising skills in communication with patients

Physicians need additional preparation in communicating with patients about difficult issues, such as those related to death and dying. There is a need to expand skills in cultural competence/awareness and to recognize that some patients may have health literacy issues.

Additional gaps and opportunities for improvement in the medical education system were identified:

Absence of a true educational continuum

The system of medical education in the United States often is referred to as a continuum encompassing medical school (undergraduate medical education), residency and fellowship training (graduate medical education), and continuing professional development (continuing medical education). While the physician does progress through each of these stages of professional development, the stages have developed and are “regulated” in isolation. There are separate accrediting bodies for each phase of the continuum, so there is little incentive for joint planning and curriculum coordination across phases. The evaluation of learners also occurs with less coordination than is desirable, so it is difficult to ensure that learners are moving toward mastery in a systematic way. This is especially the case for practicing physicians.

Limitations in educational and career pathways

The total length of training from medical school through fellowship continues to increase, based primarily on the addition of multiple new subspecialty areas. The current structure of the medical education system constrains physicians to participate in such advanced training at the beginning of their career. Current

regulatory guidelines (licensure, certification and credentialing) affect the ability of physicians to make midcareer adjustments (such as re-entry after a period out of practice and specialty or practice changes) based on personal circumstances or changes in how health care is delivered. In general, there are limited pathways for practicing physicians who leave practice for a period to re-enter.

In addition to these deficiencies identified by the AMA Initiative to Transform Medical Education, we have additional concerns:

Inadequate exposure to family medicine and other generalist disciplines

Most schools in Canada provide some exposure to family medicine in the first two years of the curriculum but it may not be the type of exposure needed. Thus, although family physicians contribute some hours to the preclerkship curriculum, it is primarily in courses such as PBL and clinical methods that do not reveal the uniqueness of family medicine as a discipline. A number of schools has experimented with a variety of approaches to provide student experience in family practice in the first two years. Perhaps the most radical is the Cambridge Community-based Clinical Course – a fifteen month placement in a single practice replacing the hospital-based junior medical and surgical placements and the whole of their specialty rotation. This small pilot study showed that such an approach was feasible, and students learned at least as well as their peers in the regular curriculum. (Oswald, Alderson & Jones, 2001)

A number of schools in Canada, recognizing the inadequate exposure to generalist discipline in their curricula, established task forces to examine this issue in depth. The reports from these schools should be reviewed – Schulich School of Medicine and Dentistry at the University of Western Ontario, the Faculty of Medicine at the University of Ottawa (available at http://www.intermed.med.uottawa.ca/eng/task_force.html. Accessed December 6, 2007) and the Faculty of Medicine at the University of Toronto (available at http://www.facmed.utoronto.ca/programs/md/Generalist_Care_Curriculum_Enhancement_Task_Force.htm. Accessed December 6, 2007)

An outmoded biomedical model of medicine

Medical education overemphasizes an outmoded biomedical model bound by a seventeenth century world view of science (Engel, 1988) – it is preoccupied with the biological aspects of disease & affords insufficient attention to patients’ personal experiences of being sick. This was well expressed by McWhinney:

“In the modern university, abstraction and disengaged reason reign supreme. Knowledge has been separated from experience, thinking from feeling. The educational challenge we face is correcting, in Margaret Donaldson’s words, ‘the imbalance between intellectual and emotional development’. In medicine, the standard diagnostic method is an outstanding example of the imbalance. The physician is required to categorize the illness, but not to attend to the patient’s feelings or understand his experience.” (McWhinney, 1996)

Even Flexner recognized that medical schools had overemphasized the scientific aspects of medicine and paid too little attention to the social and humanistic aspects. (Cook, Irby, Sullivan & Ludmerer, 2006) He wrote in 1925: “Scientific medicine in America – young, vigorous and positivistic – is today sadly deficient in cultural and philosophic background.” (Flexner, 1925)

Inadequate protected time for teaching

Medical school teachers are often too busy with patient care responsibilities and academic requirements to devote the time necessary for exemplary teaching, curriculum and course development, preparation of lectures and small group discussions, and for their own educational development. It is also very difficult to protect time for educational scholarship or research. In many schools the concept of protected time applies to traditional research but not to teaching.

A ppendix III : Medical Education Study by the Carnegie Foundation for the Advancement of Teaching

Professional Preparation of Physicians

Medical Education Study

Overview

The Carnegie Foundation for the Advancement of Teaching has played a historic role in the study of medical education dating back to the [Flexner Report](#) of 1910. Today the Foundation continues its leadership role in the scholarship of teaching by conducting the Preparation of the Professions Program in six fields: clergy, engineers, lawyers, nurses, physicians and teachers. These studies investigate which curricular structures, instructional practices, assessment approaches and environmental/institutional characteristics optimally support the development of professionals-in-training.

Research Objectives

In the physician study, the team is investigating both the common challenges of preparing physicians for complex practice and some of the distinctive curricula, pedagogies and assessment practices that have been developed to meet these challenges. The central focus of the investigation is on the professional development of physicians-in-training at three key points in their clinical education: 1) the early exposure to “doctoring”; 2) the third year clerkships; and 3) the residency. At each level, three forms of learning will be examined: learning the knowledge to think like a physician, learning skills to perform skillfully, and learning professionalism to act responsibly. Outcomes of the study will include examples of innovative curricular structures, promising pedagogies and thoughtful approaches to assessment, all of which support the professional development of learners; a critique of inadequate educational practices; and a series of recommendations for strengthening clinical education.

Selected Research questions:

Curriculum: How does the formal and informal curriculum support the professional development of knowledge, skills and professionalism?

Pedagogy: What teaching/learning methods facilitate learning of knowledge, skills and values in clinical education?

Learning: How do students/residents learn to think, perform and act like a physician? What are the common struggles and transitions that student/residents encounter in becoming physicians?

Assessment: How are the knowledge, skills and professionalism of students and residents assessed?

Context: How are current university and practice environments affecting teaching and learning for students and residents? What should medical education be doing entirely differently?

Research Methods

Over a three-year period, the research team will review the literature and conduct site visits to 14 medical schools and medical centers. Data are being collected through 140 structured interviews, 50 focus groups, 200 observations and document review. Both qualitative and quantitative analyses will be employed. Findings from the study will be published in journal articles and a book by Jossey-Bass.

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