Toward a New Curriculum

Outline of a Strategic Plan for a Revised McGill Medical Undergraduate Curriculum

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Approved by Prof. H. Munroe-Blum & Prof. A.C. Masi: October 2010
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1. **EXECUTIVE SUMMARY**

**PURPOSE**

This is a proposal for a revision of the McGill undergraduate medical curriculum in the context of the “Thinking Dangerously” strategic planning exercise. The document was prepared by the writing team of David Eidelman, John Orlowski, Joyce Pickering, assisted by Melissa Knock. This is a collective work that reflects the views of the entire Educational Design Group, the membership of which is listed in the document.

**VISION**

To be recognized as Canada’s foremost medical undergraduate program, preparing future generations of graduates to take their place as leading medical practitioners, educators and researchers.

**VALUES**

**PHYSICIANSHIP**

The curriculum is designed so as to ensure that students will understand and put into practice the attributes and skills of healing and professionalism. Regardless of their eventual role in the health care system or academia, graduates will be guided by an understanding and appreciation of the relationship of the physician to the patient and by the need to act as a healer and as a professional.

**ADDRESSING THE NEEDS OF SOCIETY**

Students will understand how our health care system works and their roles within it, whether as an individual practitioner or as a member of a team. In recognition of current societal needs, the curriculum is designed to foster the development of primary care physicians as do other leading schools. Students will be prepared to participate in and help to lead the transformation of our health care system in the 21st Century.

**ADAPTABILITY AND SCHOLARSHIP**

The curriculum has been designed to ensure that graduates possess the skills required to work in an environment where both social needs and technology are changing rapidly. Students are required to do independent work and resources are available to those students that seek to pursue scholarly careers in research or medical education.

**PEDAGOGICAL PRINCIPLES**

As outlined in the document and explained in Appendix C, this curriculum is built around the principles of situated learning as an overarching framework. Briefly, situated learning is based upon the notion that knowledge is fundamentally influenced by the activity, context and culture in which it is used. This notion, together with concepts of adult and experiential learning, is used to inform the design of the curriculum.

**THE CENTRAL ROLE OF THE EDUCATOR**

To accomplish the goals of this curriculum, it is essential to develop a team of faculty members who are specially trained and equipped to lead undergraduate medical education. The curriculum proposes strengthening the centrally planned curriculum where the bulk of formal teaching is carried out by a
limited group of faculty members who are dedicated to teaching as a discipline and a career. To make this possible, the Faculty of Medicine must ensure that the importance of excellent teachers is recognized both in regard to status and resources.

**STRUCTURAL ELEMENTS**

**Physicianship:** The current physicianship curriculum will be continued. In addition, physicianship will be used as a guiding value in the design of the other elements of the curriculum so as to emphasize, where appropriate, the development of skills necessary to be a successful healer and professional.

**Early Clinical Exposure:** Students will have the opportunity to interact with patients from the start of first year. By the middle of year two (end of Phase 1: Foundations of Clinical Medicine), they will have mastered basic physical diagnosis and history taking skills.

**Interprofessionalism:** In recognition of the changing roles of physicians, medical students will work with students from other health care disciplines on projects that allow each student to develop skills of participating in teams led by others as well as leading teams.

**Learning Collaboratives:** Students will be organized into a series of collaborative groups which, in addition to serving an analogous function to traditional “small groups”, will serve as the locus of case-based learning, peer-to-peer learning and evaluation, and reflection.

**Independent Study:** All students will complete a project of independent study before graduation. Projects may fall into one of three categories: scholarship, clinical innovation or social action.

**CURRICULAR ORGANIZATION**

The temporal sequence of the new curriculum is similar to that already in place with three major phases. However, as detailed in the document, major changes are proposed in content and form within that temporal structure, particularly in the first phase which will de-emphasize lectures in favor of group learning and independent study.

**CURRICULAR IMPLEMENTATION**

A key goal for the curriculum is to permit measurable outcomes that can be used for ongoing adjustment and improvement. To this end, the document proposes 8 desired characteristics of McGill medical graduates that are intended to serve as benchmarks against which measured outcomes will be assessed.

The establishment of an Office of Evaluation and Assessment will be a key element in the oversight and continuous monitoring of these curricular innovations.

**Winning Conditions**

Successful achievement of the goals of this curriculum will require the investment of substantial resources by the Faculty of Medicine. These are summarized in the document as winning conditions.
2. **INTRODUCTION**

In the summer of 2008, the Faculty of Medicine of McGill University embarked on a strategic planning process. The goal is to develop a vision for all aspects of our Faculty as we move ahead, and to translate this vision into measurable outcomes so we can evaluate our progress towards achieving them. Early in the process it became evident that the major themes for renewal fell into three major areas – education, research and faculty lifecycle. Design groups were struck to address each of these areas, and this report summarizes the activities of the Education Design Group.

One of the initial tasks of the Education Design Group was to define which of the many educational activities of the Faculty of Medicine should be our focus. The Faculty has approximately 700 students in the MD,CM program, 1000 residents in postgraduate medical education programs, 600 students in Nursing, 500 students in Physical and Occupational Therapy, and 1300 graduate students in various biomedical departments. The Faculty also provides teaching to many undergraduate students (>1700 students in five different Bachelor of Science programs: Anatomy & Cell Biology, Biochemistry, Microbiology and Immunology, Pharmacology & Experimental Therapeutics, and Physiology), although these students are formally enrolled in the Faculty of Science. A number of continuing professional development courses for practicing physicians and other health professionals are also offered by our Faculty, as are public education seminar series.

It was clear that given the proposed one-year timetable for the Education Design Group, the scope must be limited. The MD,CM program was selected for review and revision. This is consistent with the choice made by the Association of Faculties of Medicine of Canada (AFMC) who focused on undergraduate medical education in the initial part of their Future of Medical Education in Canada (FMEC) project, and also allowed us to address pressing accreditation issues for this program. Finally, unlike postgraduate medical education and graduate programs, the MD,CM program is centralized, making it feasible to review within a year.

Within the MD,CM program, the Design Group focused on curriculum and some of the implications of curricular change for faculty development and faculty lifecycle issues. The important role of the admissions process in determining the “end product” of our curriculum was also acknowledged. However, the admissions process has very recently been reviewed, and a new interview format (multiple mini interviews) was introduced for the first time for the class of 2013 (entering in 2009). Before introducing further changes, it was thought prudent to monitor the effect of this new process. Finally, the issue of the length of curriculum was not touched on in any detail. Current accreditation standards mandate a minimum curriculum length of 130 weeks. Thus, the only practical choice is between a three and a four year curriculum. Given that slightly under 50% of the MD,CM class enter without a university degree (the Med-P program), as well as the many topics and skills that need to be taught, there was general consensus that a four-year program should be maintained.

This report begins with a brief description of our deliberations regarding the present strengths and perceived weaknesses of the current curriculum. From this exercise, an enlightened vision and mission for the MD,CM curriculum was crafted, including a list of the attributes that we believe McGill medical graduates should display. This was arrived at after several presentations and small group sessions where consensus was developed. This description of our desired outcome provides an important focal point by which to consider the recommendations.

We then provide sections that address the following aspects: (1) the rationale as to why changes are needed; (2) a summary of the major goals of curricular change; (3) our educational framework; (4)
suggestions for a structure that will enable the accomplishment of these goals; (5) some thoughts on implementation; and finally (6) the evaluation and validation of changes.

Recent Faculty of Medicine Task Force reports on Student and Resident Mistreatment (August, 2008) and Family Medicine (February, 2009), and action plans on Accreditation (August, 2009) as well as the recent report of the Committee of the Future of Medical Education in Canada of the AFMC (January 2010), provided thoughtful analyses and suggestions which were helpful to our Design Group.
3. **THE EDUCATION DESIGN GROUP**

3.1. **Members of the Team (listed alphabetically)**

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3.2. DESCRIPTION OF THE PROCESS

The curriculum was developed by this committee as a group effort. In addition to plenary sessions involving all members of the curriculum, three sub-groups were established, which looked at best practices in medical education, the role of basic science in the curriculum and issues surrounding family medicine and public health. The co-chairs, working with Dr. Steinert, acted as a writing team to prepare drafts of this document, which were then vetted and approved by the entire committee.

Two external consultants were involved in the development of this curriculum: Dr. Molly Cooke of the University of California at San Francisco and Dr. Jordan Cohen, the President Emeritus of the Association of American Medical Colleges (AAMC). Both spent time with the entire committee and met extensively with the writing team, providing important input on the elements and structures of the curriculum.

3.3. SUMMARY OF DELIBERATIONS

Rationale for a New Curriculum

Preamble: The McGill Faculty of Medicine is widely recognized for the high quality of its educational programs. We have been graduating physicians for over 175 years and are proud of the high quality of our graduates, although our pride is often based on anecdote rather than on data. Indeed, we may have become somewhat complacent, an attitude that is not compatible with excellence, particularly in a field as rapidly changing as medicine. Fifteen years ago, the medical school curriculum was revised significantly by replacing the disconnected teaching of the basic sciences (each subject taught in isolation) with a more integrated systems approach (the familiar unit structure) that forms the current Basis of Medicine (BOM). Eight units each include anatomy, histology, physiology, biochemistry, genetics and epidemiology relevant to the systems being covered. This organizational framework markedly improved the communication of basic science principles and their relevance to the understanding and practice of medicine. In 2005, the MD,CM program was further modified by the introduction of a component termed "physicianship", which refers to the two roles of the physician as both healer and professional. However, despite these as well as other modifications to clinical teaching, a number of deficiencies remain or have emerged and are a call for serious reflection and ultimately remediation. Listed below are number of concerns that mandate a need for change.

The current curriculum is deficient on several levels:
1. Accreditation
   a. We have had repeated challenges from accrediting bodies concerning our practices, including insufficient promotion of independent learning and inadequate centralization of the curriculum. We have been threatened with probation by the LCME/CACMS, due to 13 of approximately 132 standards that we do not meet. These 13 standards include: regular strategic planning that results in measurable objectives, regular review of all courses, curricular components and the entire curriculum, and central control and management of the curriculum. Probation would be a major black mark for our medical school – only two other faculties in Canada have ever been placed on probation. So review, planning and change in our curriculum are in fact not options – they are requirements.

2. Societal needs
   a. Our graduates consistently perform poorly in public health and C2LEO (communications, cultural competence, legal, ethical and organizational aspects of the practice of medicine). In spite of our physicianship curriculum, which is now in its 5th year, our students continue to show a relative lack of objective knowledge of these important areas. Although there are various possible explanations for this, including weaknesses in the physicianship curriculum itself, it is also noteworthy that in the Ingram report (Ingram & Co., 2008), which investigated the impact of the physicianship program, students cited the pressures and assumptions of the Basis of Medicine component of the curriculum as hampering their acquisition of many of the knowledge, attitudes and behaviours of physicianship.

   b. Insufficient number of family physicians: Our province clearly believes that medical schools provide a societal benefit, as evidenced by the fact that they subsidize 90% of the education costs. We know from the Global Burden of Disease study (Murray & Lopez, 1996), that more than 80% of the disease burden in Canada comes from chronic diseases, and we also know that patients with chronic diseases benefit from primary care physicians. The studies of Starfield and colleagues have demonstrated the population health benefit of primary care physicians, a benefit that has not been demonstrated for specialist physicians (Starfield, Shi & Macinko, 2005). Those who work in clinical care in McGill teaching hospitals are faced daily with the difficulties of dealing with patients who don’t have a family doctor. However, McGill has the smallest percentage of students choosing family medicine as a career of all 17 medical schools in Canada. Although specialist physicians and medical research clearly contribute to societal needs, an appropriate balance needs to be found, with more of our graduates choosing family medicine.

3. Evolution of medical practice
   a. It is estimated that scientific knowledge doubles approximately every seven years. Practicing physicians are made aware daily of new tests and treatments. Studies have shown that the strongest predictor of the use of particular drugs is the year of graduation from medical school, and that good outcomes for patients are inversely correlated with the length of time from completion of training (Choudhry, Fletcher, Soumerai, 2005). Thus, the first four years of medical training can no longer be viewed as the time to instill the basic facts that will allow a student to begin a postgraduate program, but rather a time to develop the skills of lifelong learning.

   b. As scientific knowledge grows, the care of patients becomes more complex, and physicians increasingly rely on other professionals in order to provide complete care for patients. Approximately 9,000 to 24,000 Canadians die of medical errors each year (Baker et al, 2004) and effective interprofessional teamwork has been shown to be an
important element in reducing these errors. Our curriculum currently includes only one 3 hour session specifically on interprofessionalism, and there is no formal interprofessionalism training during the key clerkship component of the curriculum.

4. Scholarship and Critical Thinking
a. A scientific approach and the ability to think critically are fundamental to being able to adapt to rapid changes in technology and therapeutics. Given McGill’s strength in medical research, we should be able to demonstrate that our MD,CM graduates are well versed in critical thinking and the application of the tools of scholarship. However, we have no data showing that this is the case.

5. Current Educational Methods and Approaches
a. The Basis of Medicine component of the curriculum relies on didactic lectures as the teaching method for about 60% of student contact time. Although there are almost no data suggesting that other teaching methods are more effective in training physicians in basic sciences, extensive use of didactic lectures may leave students feeling disconnected from the learning process. There is limited data suggesting that a problem-based approach leads to better lifelong learning skills (Hartling et al, 2010; Shin, Haynes & Johnston, 1993).

b. Clerkships follow an apprenticeship model, with insufficient standardization and centralization of objectives and clinical experiences. Although we could find no data demonstrating that such an approach has an impact on the quality of graduating physicians, it is clear that accrediting bodies insist that our approach change. Some progress within our clerkship has been made in this regard, but further work is needed.

The new curriculum must address each of these directly. In addition, it is likely that admissions criteria and processes may contribute to selecting students more apt to choose family medicine, as well as those who will work well interprofessionally.

A NEW CURRICULUM MUST ADDRESS THE FOLLOWING ISSUES:

1. As a publicly funded institution we need to address the needs of the society that support us.
   a. Currently only 18% of McGill graduates choose family medicine as their first choice. We must increase enrollment in family medicine to levels similar to peer-institutions (e.g. University of Toronto, ~30%)
   b. Students must understand and demonstrate an acceptable knowledge of the importance of public health, the role of the health care system in the care of patients and the social determinants of disease.
   c. Students must be well prepared to participate in and have the skills to lead interprofessional teams of caregivers.
   d. Students must demonstrate skills in the management of high prevalence chronic diseases as well as typical, healthy aging.
   e. Students must develop into leaders in the transformation of the health care system and of health care delivery.

2. To ensure excellence in education, we must identify, support and develop superior teachers and encourage these individuals to take a leadership role in the medical school. In doing so, we must provide appropriate incentives, including the availability of:
a. **Recognition:** Financial and/or public acknowledgement (e.g. awards) of outstanding teachers

b. **Resources:** Space, availability of teaching resources including educational consultants or specialists and the provision of new technologies to aid teaching.

c. **Academic promotion:** Although teaching is a criterion for promotion at all levels, it must be valued and perceived to be valued equally with research contributions.

d. **Leadership positions:** Educational excellence should be an explicit criterion in the recruitment of faculty leaders such as Department Chairs.

3. Teaching is provided by all physicians with McGill appointments. While we recognize that some will be superior, all physicians must have clear expectations about their teaching responsibilities, and the need for faculty training required for this task.
   a. All letters of appointment should include explicit statements about the proportion of time that is required to be devoted to teaching.
   b. Faculty development should be a requirement for all faculty members, and this should be stated in their letter of appointment.

4. To promote the ability of graduates to adapt to a world where rapid technological change, exploding clinical evidence and radical social change are the norm, we need to adopt educational practices that promote and foster strategies for ongoing learning and adaptation. While recognizing the limited evidence that is available on educational methods that promote lifelong learning, the following strategies were thought to be likely to promote such skills:
   a. More case-based learning
   b. Peer-directed learning and teaching
   c. An explicit focus on scientific principles underlying our current understanding of both basic science and clinical phenomena, and on clinical reasoning and critical thinking.

5. Exposure to clinicians, particularly primary care physicians, needs to begin early in the curriculum and continue longitudinally.
   a. Students should have longitudinal clinical exposure beginning in year one.
   b. This clinical exposure should be an explicit and integrated part of the unit structure.
   c. The clinical exposure must have specific learning objectives and be rigorously evaluated.

6. To counter the “hidden curriculum”, there must be ongoing development of the Physicianship program, as well as activities in other courses, particularly clerkships.
   a. Role modeling by faculty needs to be made more explicit. It also needs to be valued and evaluated.
   b. We need to extend this effort to the residency level given the importance of near-peer influence on learners in the clinical phases of the curriculum.
   c. A code of conduct for both learners and faculty, with clear consequences for behaviour that is not remediated, will be an essential adjunct to this curriculum.

7. To ensure that students have comparable opportunities for learning, and that we can demonstrate that all objectives are covered, this curriculum will be centrally managed.
   a. Course objectives will be distributed from the Undergraduate Medical Education office to all course directors.

8. To ensure that students are well prepared to work in teams
   a. Experience with interprofessional teams will begin in first year and continue throughout the curriculum.
b. Students will have the opportunity to work as members of teams led by members of other health care professions.

c. Students will learn skills necessary to lead interprofessional teams.
4. **OBJECTIVES AND GOALS**

4.1. **VISION STATEMENT**

*To be recognized as Canada’s foremost medical undergraduate program, preparing future generations of graduates to take their place as leading medical practitioners, educators and researchers.*

4.2. **MISSION OF THE MD,CM PROGRAM**

The purpose of this curriculum is to prepare students for careers as key members of the medical community, whether in clinical practice, in medical education, in research or as leaders of the health care system.

To this end, the curriculum is based on a set of premises and orienting statements:

1. The foundational sciences (biological, physical, social and behavioural) and scientific methodology are the pillars of medical knowledge. The application of scientific approaches to clinical evidence and to interpretation of the literature is a fundamental skill of physicians, whether they work primarily in clinical practice or the creation of new knowledge.

2. The two roles of a physician, those of a professional and of a healer are complementary to each other and are served simultaneously. The healer role, which is at the core of the medical mandate, is focused on the patient’s well-being.

3. Professional responsibilities extend beyond the patient-physician relationship to include public health, global health and social accountability. Moreover, while not incumbent on every graduate, the responsibilities to educate the next generation of physicians, to contribute to the creation of new knowledge and to improve of the health care system are also intrinsic to the medical profession.

4.3. **ATTRIBUTES OF THE MCGILL MEDICAL GRADUATE**

To help implement this mission and to guide the implementation of the curriculum, the Education Design Group developed the following list of attributes of a McGill medical graduate. This list is intended as a “test” against which the individual elements of the curriculum are to be judged. Moreover, it is expected that continuous improvement of the curriculum can be made by comparison of achieved results with these attributes.

1. **Demonstrates stage-appropriate clinical expertise**

2. **Demonstrates the attributes of Physicianship (healing and professionalism)**

3. **Demonstrates effective communication skills**

4. **Demonstrates interprofessional skills and the ability to be part of a team**
5. Demonstrates critical thinking and decision-making

6. Demonstrates evidence of the skills necessary to adapt to changes in practice, technology and societal needs

7. Demonstrates understanding of the health care system and the role of public health

8. Demonstrates through independent work the understanding of scholarship

Appendix A provides a table indicating how each of these attributes is addressed in the present curriculum proposal.
5. OUTLINE OF THE CURRICULUM

5.1. ORGANIZING ELEMENTS

5.1.1. PHYSICIANSHIP

In 2005, the MD,CM program was modified through the introduction of a component entitled “Physicianship”, which refers to the two roles of the physician – the physician as healer and professional. The program defined a set of personal attributes and commitments required to fulfill the two roles (see Appendix B for details). Professionalism has been assumed to be in the service of the healer role. The Physicianship component was deployed via a series of courses including the longitudinal Physician Apprenticeship. It is proposed that Physicianship Apprenticeship be maintained in the modified curriculum, with adjustments that account for changes in the timing of clinical exposure and altered emphasis on subject matter. However, as an underlying value of the curriculum, aspects of physicianship will be integrated widely, particularly in the clerkship phase. In addition, many ethical and health law issues are well suited to be addressed during the clerkship.

A key issue that has been identified both in exit surveys of current medical students, and in the discussions of the Education Design Group, is that current practice in the hospitals is often at odds with the principles of Physicianship. The dissonance between what is studied and what is experienced in the “real world”, leads students to devalue some of what has been learned, engendering some cynicism. Improvement in Physicianship outcomes will depend on greater attention to faculty development in this area, along with reinforcement of positive behaviour among post-graduate trainees, who have an enormous influence on medical students during clerkship rotations. The evaluation of Professionalism among faculty members along an enforced code of conduct is another important element in ensuring success of our goals in this area.

5.1.2. PEDAGOGICAL PRINCIPLES

Although many educational theories could be applied to our curricular vision, we have chosen situated learning (Brown, Collins & Duguid, 1989; McLellan, 1986) as an overarching framework for curricular renewal and implementation. Situated learning is based upon the notion that knowledge is contextually situated and fundamentally influenced by the activity, context and culture in which it is used. This view of knowledge as situated in authentic contexts has important implications for our understanding of teaching and learning as well as the design and delivery of instructional programs and activities. Key components of situated learning include cognitive apprenticeship, collaborative learning, reflection, practice and articulation of learning, all of which are addressed in the proposed curricular structure. A detailed description is found in Appendix C, which also describes principles of adult learning and experiential learning, other educational frameworks which inform our curricular vision.

5.1.3. TEACHING AND LEARNING METHODS

The Design Group recognized that there is a wide variety of learning styles, and that the curriculum should reflect this diversity. In addition, for most learners, reinforcement of the same or similar material through various teaching and learning methods is desirable. Thus we believe that a range of pedagogies, such as lectures, labs, small group activities, case-based and/or problem-based learning, simulation, online, written essays and direct clinical experience will be employed. However, three forms of teaching are particularly important and should be emphasized. These are:
a. **Simulation-based training**: This form of training is widely appreciated by students and trainees. More importantly, data show that simulation-based training is not only effective in conveying understanding and skills; it can have a positive impact on patient outcomes (Barsuk et al, 2009; Wayne et al, 2006). Simulation allows situated learning in a relatively controlled environment.

b. **Case-based learning**: This is thought to be particularly important for linking scientific concepts to clinical situations – a way to situate learning. It also allows the Faculty to ensure that certain defined clinical presentations are covered systematically by all students.

c. **Online learning**: There is potential for using online learning in every part of the curriculum. Clinical cases can be presented online, as can quizzes, cartoons and videos of surgical procedures or clinical cases. Online learning should not replace human contact with a teacher, or with patients, but can be a valuable adjunct.

We also note the phenomenon of test-enhanced learning. Regular testing should be carried out with high quality, reliable instruments (multiple choice exams, written questions, essays, Objective Structured Clinical Examinations (OSCEs), etc.) both to enhance learning and to allow monitoring of the curriculum. An end of clerkship examination (OSCE style) should be introduced. With regard to the design of evaluation tools, consideration should be given to using approaches that reflect the values we are trying to teach. For example, peer assessment and 360° evaluations should occur, emphasizing the value we place on collaborative learning and interprofessionalism.

The creation of an **Office of Evaluation and Assessment** will be necessary in order to support the development of such tools.

### INDIVIDUALIZATION

The Design Group recognized the challenge of individualizing learning, while standardizing outcomes. To encourage individual development during medical training, flexibility will be added in two major areas. All students will be required to take one elective course during the afternoons of Phase 1 of the new curriculum, which we have renamed “**Fundamentals of Clinical Medicine**” (formerly Basis of Medicine). Options would include global health, medical French, medical anthropology, etc. In addition, students who wish to take a year off to pursue other training such as research, a Masters of Public Health degree, etc. will be encouraged to do so. The current generous elective time (20 weeks) should be maintained.

### 5.1.4. THE CENTRAL ROLE OF THE EDUCATOR

During our deliberations, it became clear that an important barrier to progress in improving the MD,CM curriculum relates to the educators. Too many aspects of the curriculum are currently taught by individuals who have been reluctantly drafted into presenting lectures of doubtful relevance to the students. An excellent educational milieu can only be achieved with a strong team of well-trained and highly motivated teachers who view the educational mission as central to their careers. As outlined in Section 6, the Faculty will have to make substantial investments in fostering the careers of committed and well-qualified teachers, particularly during the Fundamentals of Clinical Medicine component, where teaching quality is currently highly variable. More generally, educational excellence must come to be seen as one of the Faculty’s core competencies, along with its nature as a research-intensive medical school. This must be made clear through policies on promotion and resource allocation.
A key assumption underlying this proposal is that the Faculty of Medicine will move toward developing a strong team of elite educators who will set the pace for excellence in teaching in the classroom and at the bedside.

5.2. STRUCTURE OF THE CURRICULUM

The four-year curriculum should be organized around 3 phases. Although clinical exposure will be a constant throughout the curriculum, the phases mark growing involvement and responsibility in the care of patients.

Strengths of the current curricular structure that were identified and should be retained include:

a. A systems-based structure for the teaching of basic sciences (our current unit system).

b. An early clinical phase (Introduction to Clinical Medicine) that is unique to McGill and that allows students to learn in a clinical environment that is teaching-intensive yet without direct patient care responsibility.

c. A clerkship phase that allows a degree of clinical involvement and responsibility that is relatively high compared with many other North American medical schools.

d. The physicianship component of the curriculum, which emphasizes healing and professional skills over the four years, and which includes a four year small group mentored experience as well as a “Medicine and Society” course in fourth year.

5.2.1. LONGITUDINAL ELEMENTS OF THE CURRICULUM

In addition to the temporally dispersed curricular elements outlined below, the curriculum proposes to emphasize a number of longitudinal elements that are central to the education of future physicians. These include physicianship, interprofessionalism and the acquisition of skills necessary for successful self-directed learning and continuing medical education throughout a career.

5.2.2. FUNDAMENTALS OF CLINICAL MEDICINE (PHASE 1)

This phase (formerly called Basis of Medicine) will focus on providing students with basic skills, vocabulary and experiences that prepare them to become active participants in the health care team. This includes basic sciences, behavioral sciences, fundamentals of public health and the health care system and an introduction to history taking and physical examination. The teaching of basic sciences and related subjects will be organized so as to complement the clinical experiences in a synergistic manner. The fundamentals of clinical epidemiology and study design will ensure a base for the development of critical thinking as applied to the clinical context.

Lectures:
The current unit-based approach will be altered by restricting formal classroom work to the mornings. Lectures will be provided by selected faculty members with a demonstrated ability to summarize information and put it into context for health science professionals. Based on a centrally planned and coordinated curriculum, the content of the lectures will be adapted to provide medical students with the vocabulary and background information they need for clinical work. The goal will be to provide sufficient basic information to permit understanding of clinical material such as clinical biochemistry, pathology, pathophysiology and pharmacology. Where possible, basic science material will be presented by physician-scientists or by basic-scientists with a good understanding of the clinical milieu. Traditional basic science information will be complemented by pertinent material from the social sciences and psychology. “Content-based” lectures will be interspersed with “clinically-based” lectures to permit
students to learn about the context and relevance of the factual information presented during lectures. Choice of topics for lectures will be guided by the clinical presentations in the Medical Council of Canada objectives.

In keeping with the goal of incorporating physicianship and social responsibility into every aspect of the curriculum, themes such as societal needs, cultural sensitivity, public health and organization of the health care system will be woven into the classroom sessions.

Fewer teachers will be used in each unit, preferentially using those able to integrate several disciplines into their teaching. Over time, it is expected that lecturing to students in Phase 1 will come to be seen as a privilege only accorded to elite teachers with special skills in effectively communicating complex information to a large class. The afternoons of Phase 1 will be reserved for 3 major activities: case-based learning, clinical exposure and Physicianship.

**Learning Collaboratives:**
Each student will also be a member of a student group (learning collaborative) whose membership will remain constant during this phase of the curriculum. These groups will be the focus of self-directed learning and peer-to-peer teaching that will be structured around a series of clinical problems guided by the clinical presentation in the Medical Council of Canada objectives. By coordinating the timing of the clinical problems to be addressed in the small groups with the timing of lectures, a comprehensive view of each subject will be presented. Each collaborative will be provided with a faculty mentor (non-content expert), whose role it is to meet with the group on a weekly or bi-weekly basis in order to monitor progress, identify issues with individual students or with group dynamics and to encourage reflection by students on their progress in the curriculum.

**Clinical Exposure:**
Each student will spend one afternoon every 1-2 weeks in a clinical setting. Ideally, at least 2/3 of this clinic experience will be under the preceptorship of family physicians. Students will also have the opportunity to spend some of their clinical exposure time with non-physician health professionals such as nurse practitioners, clinical psychologists, and nutritionists. Clinical exposure in Phase 1 will also serve as a trigger for beginning to understand the functioning of our health care system. The learning collaboratives will be used as a locus for reflection and discussion on issues related to the health care system and to professionalism in practice based on the experiences of students during their clinical exposures.

In addition, as part of the clinical exposure component of Phase 1, students will be taught basic physical examination and history taking skills with the expectation that at the end of Phase1, they should be capable of conducting a basic history and physical at a level sufficient to prepare them for clinical cases in Phase 2.

**Case-based Learning:**
Afternoons not given over to clinical exposure will provide time to work through clinical problems, prepare for small groups and participate in elective courses. Cases will serve to reinforce the material presented in lectures and will be structured so as to ensure that students develop skills in information retrieval and interpretation. In addition to cases that illustrate basic science principles, cases will also deal explicitly with social sciences, public health and the organization of the health care system. The curriculum will include a series of interprofessional group experiences in which medical students will participate in case-based learning led by students in nursing or the rehabilitative sciences. There will be a system of regular quizzes and examinations both to track the progress of individual students as well as to ensure that the program is meeting the needs of learners.
5.2.3. **PRINCIPLES OF CLINICAL PRACTICE (PHASE 2)**

This phase (formerly called Introduction to Clinical Medicine) will build on the basic science principles and the clinical skills acquired in Phase 1. The overall objectives of Phase 2 are to:

- **a.** review, consolidate and learn more advanced data gathering skills (history, physical exam, laboratory, imaging)
- **b.** learn to translate the data into hypotheses, differential diagnoses and simple management plans
- **c.** demonstrate skills in critical appraisal relating to clinical situations encountered during the phase
- **d.** demonstrate the ability to perform minor procedural skills appropriate for this level (such as phlebotomy, intravenous cannulation, fecal occult blood testing, urinalysis, suturing, bag and mask ventilation, capillary blood glucose testing)
- **e.** demonstrate an understanding of the health care system, public health and ethics and how a patient’s health is situated in this context.

Some of the content of Phase 2 will resemble content in the current Introduction to Clinical Medicine (ICM) component. For example, the Introduction to Internal Medicine course currently has a strong focus on learning to translate data into hypotheses, differential diagnoses and simple management plans. Other content issues currently in Phase 2 would be more appropriately moved to clerkship. Some of the current ICM content (such as physical exam skills) will already have been covered in the first year and a half. In order to ensure coverage of core topics, all students will continue to work through a set of clinical presentations that are derived from the overall curricular objectives (either via exposure to real patients, simulated situations, online or paper-based cases).

There should be a significant interprofessional component to Phase 2. Two areas which may lend themselves to interprofessional learning include learning minor procedures, and learning about the health care system, public health and ethics. Learning collaboratives may be reformulated to take into account the practical necessities of learning in a clinical environment, but the principles of group-learning, peer-to-peer teaching and self-directed learning should be maintained by explicitly building these into the teaching and evaluation structure.

5.2.4. **PARTICIPATION IN PATIENT CARE (PHASE 3)**

This phase (also called Clerkship) will emphasize developing clinical skills in clerkship settings. Critical appraisal projects will also be required in each discipline, further developing the students’ skills in this area, and providing situated learning. Interprofessional care must be explicitly addressed during clerkship and the methodology for this will need to be developed.

To accommodate different learning styles and to promote a generalist approach to clinical presentations, integrated clerkships will be available to selected students. Integrated clerkships will be based on the Harvard-Cambridge model (Acad. Med. 2007 82:397-404) adapted to the Québec health care system. This approach to clerkship will take advantage of the increasing prominence of family medicine/generalist hospital settings including those at St. Mary’s and Gatineau. It is expected that the Lachine campus of the MUHC would eventually serve as an additional site. Gatineau and Lachine would provide the opportunity for French language training at the UGME level. In addition, conventional rotation-based clerkships will continue to be offered at the other teaching hospitals (MUHC, JGH).
5.2.5. INDEPENDENT STUDY

All students will complete an independent study project during medical school. To reinforce the importance of independent scholarship and learning as part of the role of a physician, every MD,CM student will complete a project involving independent research, clinical practice innovation or social action.
6. IMPLEMENTATION AND VALIDATION

6.1. IMPLEMENTATION STRATEGY

To bring the new curriculum into being, a specific curriculum implementation process needs to be developed. This could entail the creation of a specific curriculum steering committee, designated by the Dean and chaired by the Associate Dean, UGME, or their designate. This committee will oversee the curriculum revision process. The steering committee will be responsible for establishing an implementation time table and the creation of teams that will focus on the implementation of each element in the plan.

In addition to topic or course specific design teams, committees will be mandated to look at overarching elements of the curriculum including the manner in which it will be centrally managed, longitudinal elements of the curriculum and the use of simulation and educational technology in the curriculum.

6.2. THE CENTRALITY OF MEASUREMENT AND EVALUATION

Measurement and evaluation at all stages of the curriculum is necessary. Although we must maintain surveys of student satisfaction with courses and with the curriculum overall, as well as performance on standardized exams, we must move beyond to track our graduates into practice. We must also incorporate program evaluation of curricular change and implementation to assess impact and effectiveness and to ensure that available evidence informs our curriculum. The adoption of a specific set of goals for the MD,CM graduate (listed in Section 4.3) provides a means to judge the impact and outcomes of curricular change against the benchmark of the proposed attributes of the McGill medical graduate.

As noted above, we propose the creation of an Office of Evaluation and Assessment which will take a leading role in tracking the impact of our curriculum.
7. **WINNING CONDITIONS**

For this new curriculum to succeed, a number of radical changes in the way in which the undergraduate curriculum operates will be needed. These will require major commitments in resources from the Faculty.

a. **Establishment of core teaching faculty:** Although arguably most urgent in Phase 1 (Fundamentals of Clinical Medicine), methods need to be developed to identify, recognize, promote and reward those individuals in the faculty who have made a commitment to teaching as a career choice and who have demonstrated superior ability in one or more styles of teaching. This requires the development of methodology to measure teaching effectiveness beyond popularity as well as the commitment of resources to help make teaching careers not only possible but attractive and rewarding.

b. **Raising the profile of teaching:** It is expected that one of the outcomes of the Faculty Life Cycle component of Thinking Dangerously will be the reinforcement of the importance of teaching as a career path in the Faculty of Medicine. Specific initiatives, including formal recognition of teachers, promotion of teachers based on educational excellence, appointment to leadership positions and allocation of resources such as space, will be used to reinforce education as a core mission of the Faculty. Moreover, henceforth letters of appointment from the Faculty to all prospective recruits will explicitly underscore the importance of teaching and learning.

c. **Faculty development:** In the end, the curriculum can only be as strong as its faculty. To this end, the Faculty of Medicine should develop a **required curriculum** for all faculty members that prepares them to undertake teaching tasks, whether at the bedside, in the classroom or elsewhere.

d. **The strengthening of a centrally-managed curriculum:** A strong organizational framework is needed to ensure that all students are given an opportunity to learn the material necessary to achieve the desired attributes of the graduating student listed above. Built around situated learning, a curriculum map must be drawn that explicitly accounts for the material to be learned within each segment of the curriculum. This map must be developed to a level of granularity sufficient to permit measurement of outcomes.

e. **Establishment of the infrastructure for measurement:** An inherent weakness of the previous curriculum is that decisions about changes are largely based on intuition rather than data. To ensure that the new curriculum is able to adapt to changing scientific knowledge, clinical information and societal needs, it is essential that the impact of educational initiatives be measured against the attributes of the McGill graduate. Measurement must be continuous and regular in order to monitor educational effectiveness over time.

f. **Regular review of the curriculum:** In addition to the conventional monitoring of undergraduate medical education by the curriculum committee and the CSPCO, a regular, formal review of the curriculum will be carried out no less than every four years. Led by the Associate Dean, UGME, this review would involve the development of a formal report on curricular progress to the Dean of Medicine. This report would be reviewed by a site visit involving experts in undergraduate medical education from leading universities in Canada and elsewhere.

g. **Extension of these efforts beyond UGME:** This is particularly important for professionalism, communication and other elements of Physicianship. Currently, the experience of students on their clerkship rotations is highly variable with regard to the attitudes they observe among residents,
fellows and attending staff. There can be little real progress in promoting physicianship unless these elements of physicianship are more widely embraced in practice, particularly in high stress settings such as in the clinical environments.

And finally, we need to work in congruence with the goals of our partnering health care institutions.

**Conclusion**

This curriculum, based on sound pedagogical principles and reflecting our mission and values builds on almost two centuries of experience to prepare future students for the needs of patients and society in the 21st Century.
APPENDICES
### APPENDIX A: ATTRIBUTES OF A McGill Graduate

<table>
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<tr>
<th>Attributes of a McGill Graduate</th>
<th>Fundamentals of Clinical Medicine (Phase 1)</th>
<th>Principles of Clinical Practice (Phase 2)</th>
<th>Participation in Patient Care (Phase 3)</th>
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</table>
| 1. Demonstrates stage appropriate clinical expertise | • Students will be engaged with case-based reasoning and case-based teaching throughout their basic science education.  
• Students will learn the components of the physical exam and history that correspond to each foundation of clinical medicine, reinforced by seeing and practicing these skills in family medicine settings. | • Students will be competent to perform a clinical exam in the ambulatory, clinical and community settings, and identify when to use each component of the examination.  
• Students will also be oriented to perform administrative tasks and management components, including: charting, scheduling software and use, etc. | • Students will demonstrate competence in taking an appropriate history and physical.  
• Students will be increasingly able to formulate differential diagnosis, diagnostic work up plan, and treatment plan.  
• Students will work appropriately in team setting, demonstrating knowledge of the role of OT, PT, nursing care, and know when and how to arrange for supportive care through the CLSC and other community support mechanisms. |
| 2. Demonstrates the attributes of physicianship (healing and professionalism) | • Students will begin using peer-evaluation, in order to encourage and support self-regulation, self-reflection, and being a professional member of the medical community.  
• Students will also be taught how to provide effective and efficient feedback. | • Students will provide constructive peer feedback and evaluation in clinical settings during morning teaching sessions.  
• Students will demonstrate and be evaluated on their professional behavior and communication skills with patients. | • Supportive interactions between nurses, physicians, patients and family will be purposeful modeled and reflected in the student’s approach to patient care. These elements will be central for clerkship evaluations from supervisors.  
• Opportunities for students to work in family medicine, palliative care, pain clinics, and other settings where quality of life and whole person care are central to practice will be expanded and emphasized. |
| 3. **Demonstrates effective communication skills** | • Students will be asked to write a patient case report for their first year patient. Students will also begin basic charting and practice clear, concise medical communication. Students will also engage in the SEDE “Burst your bubble” program to encourage encounters with individuals in a variety of social, financial, regional, cultural and ability backgrounds.  
• Students will learn how to approach behavior change and motivational interviewing from nursing students.  
• Students will undergo cultural competency training in caring for First Nations, Inuit, and Metis patients and working in Aboriginal communities. | • Students will be asked to create a publicly accessible information source (pamphlet) for their area of interest (psychiatry, surgery, pediatrics, etc.). Students will have their projects evaluated by members of the public, and by patient communication experts. This will permit students and opportunity to practice their patient communication skills.  
• Students will practice using interactive patient decision guides with standardized patients and tools which support shared decision making tools. | • Students will engage in a multitude of simulations at the Simulation Centre including dealing with difficult physicians, difficult students, difficult patients, and engaging in conflict resolution techniques and practice effective communication abilities in a clinical scenario.  
• Students will also practice communicating through an interpreter and cross-cultural communication, exploring different constructs of health and disease. |
| 4. **Demonstrates interprofessional skills and the ability to be a team player** | • Students will begin clinical learning in a collaborative student environment.  
• Students will learn injection techniques from nursing students, joint exams from patient teachers and physical therapy students. | • Students will be asked to interview a patient with a nursing student.  
• Students will write a treatment plan and discuss the treatment plan (and the nursing student nursing plan) with the collaborative student in order to ensure whole-patient care.  
• Students (medical and physical therapy) could also collaborate on a pre-operative patient assessment. | • Students will meet with midwives, social workers, occupational therapists, dentists, etc. who are involved in their patient care. This will be a deliberate inclusion within a dynamic clinical environment in order to continue to support the notion of inter-professional education and teamwork. |
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<th>5. Demonstrates critical thinking and decision-making</th>
<th>Students will prepare, and analyze student-generated reports of “challenging cases” that demonstrate basic science principles. This will provide experience in considering stage-appropriate expertise, provide context for basic science principles, and provide a bank of case-based science principles.</th>
<th>Students will present peer-evaluated critical analysis on evidence-based diagnosis in small group and clinical settings</th>
<th>Students will present peer and supervisor-evaluated critical analysis on evidence-based diagnosis and treatment options in clinical settings</th>
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<td>6. Demonstrates skills necessary to adapt to changes in practice, technology and societal needs – i.e., the ability to be a lifelong learner</td>
<td>Students will be required to submit written questions for examinations. The requirement of creating questions not only encourages critical thinking, but also appraisal of course material.</td>
<td>Student assessments will be altered to contain written evaluations, and discussion groups will be included in both the physicianship and basic science curriculum.</td>
<td>During clinical rotations, students, with the aid of their clinical supervisors, should be able to identify areas of learning deficit or knowledge gaps and be able to demonstrate further studying, investigation, and be able to participate in discussions surrounding the area of self-identified knowledge weakness. Due to the difficulty of self-assessment, this will be conducted in concert with clinical supervisors.</td>
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| 7. Demonstrates a basic understanding of the health care system and the role of public health | • During Phase 1, students will be asked to create an organogram for the health care system in order to learn the structure, stakeholders and access points into the health care system.  
• Foundations of Clinical Medicine cases will incorporate concrete applications of public health concepts and health systems which will require some advance research and consistent, core reference material which will be form the basis of learning in Phase 1 (upcoming GHEC materials, “prescription for excellence”, etc). | • Students will simulate response to outbreak scenarios for institutions and community-wide response plans.  
• Students will engage in different sides of debate on controversial areas of health system reform, including private payment for services, reorienting the focus on primary care and how to best going about doing this, provincial strategies for training nurse practitioners, midwives, community health promoters, etc. | • Students will research and write reflective pieces on health care funding gaps, priorities, and the orientation of preventative and curative care, bringing together their own experiences working in the health care system and peer reviewed research. Submissions to the MJM and the CMAJ will be encouraged. |
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<td>8. Demonstrates a scholarly approach</td>
<td>• Students will begin critical appraisal and critiquing of scientific papers and drug releases.</td>
<td>• Students will be able to identify gaps in the literature for their topic of interest. They will begin, in earnest, their longitudinal research project and mentorship by a faculty member (does not have to be medical faculty).</td>
<td>• Students will submit a completed research project. This report has been a longitudinal component of the curriculum, and can be on a variety of topics from core clinical research to social science, history, or art of medicine.</td>
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APPENDIX B: PHYSICIANSHIP

In 2005, the MD,CM program was modified and enriched with the introduction of "Physicianship" as a core aspect of undergraduate medical education. The word “physicianship” is not in common usage and thus merits definition. At McGill, it has assumed three meanings:

- First, it represents a unique vision of what are the goals of medicine: the well-being of the patient, healing, and the relief of suffering.

- Secondly, it posits a set of behavioral attributes required for fulfilling the dual and complementary roles of the physician – the physician as healer and as a professional. Professionalism is assumed to be in the service of the healer role. The requisite attributes, accompanied by operative definitions, are listed in the table below.

- Thirdly, it refers to a specific curricular component, called the Physicianship component. It is comprised of a series of 5 courses, including the Physician Apprenticeship.

The Physicianship component assumes primary responsibility for teaching, at an introductory level, core elements of the clinical method (i.e. the toolbox of skills necessary for the physician to accomplish his or her tasks). Each course has its unique focus. Physicianship-1 covers the cognitive base of professionalism and introduces concepts such as healing, alliance building, clinical observation, attentive listening, clinical thinking, inter-professionalism and ethical decision-making. Physicianship-2A teaches basic communication skills (using an adapted Calgary-Cambridge guide) and introduces the McGill case report template. Physicianship-2B is intended to teach the physical examination, (currently, this content is taught under the rubric of the Professional Skills course of ICM). Physicianship-3 emphasizes the healer role. Physicianship-4 is focused on aspects of the social contract, public health and ‘medicine in society’. The Physician Apprenticeship course is designed to promote self-reflection and to provide a ‘safe environment’ for students to discuss the professionalization process of becoming physicians. The component is managed by a coordinating committee. The committee, which reports to the curriculum committee and Associate Dean, is responsible for course delivery and program evaluation. It is also responsible for planning the annual White Coat Ceremony, which is called ‘Donning the Healer’s Habit’ ceremony.

The ‘Office of Physicianship Curriculum Development’ remains active in on-going development of content related to the Physicianship mandate. It is currently exploring two areas: (1) how one might introduce narrative competence in the McGill clinical method; and (2) how to renew the physical examination with an increased emphasis on functional assessment.

The program has been described in a manuscript: Medical Education, 2007, 41:1193-1201.

A series of 64 objectives have been developed to guide physicianship course development and deployment; it is available at: http://www.medicine.mcgill.ca/physicianship/reports.htm.
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<th>Physician’s role</th>
<th>Corresponding attributes</th>
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<tr>
<td>Professional</td>
<td><strong>Self-regulation</strong>: the privilege of setting standards; being accountable for one’s actions and conduct in medical practice and for the conduct of one’s colleagues. <strong>Responsibility to society</strong>: the obligation to use one’s expertise for, and to be accountable to, society for those actions which relate to the public good. <strong>Responsibility to the profession</strong>: the commitment to maintain the integrity of the moral and collegial nature of the profession and to be accountable for one’s conduct. <strong>Team work</strong>: the ability to recognize and respect the expertise of others and work with them in the patient’s best interest. <strong>Competence</strong>: to master and keep current relevant knowledge and skills. <strong>Commitment</strong>: to be obligated or impelled to act in the patient’s best interest. <strong>Confidentiality</strong>: to not divulge patient information without just cause. <strong>Autonomy</strong>: the physician’s freedom to make independent decisions in the best interest of patients and for the good of society. <strong>Altruism</strong>: the unselfish regard for, or devotion to, the welfare of others. <strong>Trustworthiness</strong>: worthy of trust, reliable. <strong>Integrity and honesty</strong>: firm adherence to a code of moral values; incorruptibility. <strong>Morality and ethics</strong>: to act for the public good. <strong>Caring and compassion</strong>: a sympathetic consciousness of another’s distress together with a desire to alleviate it. <strong>Insight</strong>: the ability to recognize and understand one’s actions, motivations and emotions. <strong>Openness</strong>: the willingness to hear, accept, and deal with the views of others without reserve or pretense. <strong>Respect for the healing function</strong>: the ability to recognize, elicit, and foster the power to heal inherent in each patient. <strong>Respect for patient dignity and autonomy</strong>: the commitment to respect and ensure subjective well-being and sense of worth in the patient and recognize the patient’s personal freedom of choice and right to participate fully in his or her own care. <strong>Presence</strong>: to be fully present for a patient without distraction and to fully support and accompany the patient throughout care.</td>
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<tr>
<td>Professional and healer</td>
<td><strong>Competence</strong>: to master and keep current relevant knowledge and skills. <strong>Confidentiality</strong>: to not divulge patient information without just cause. <strong>Autonomy</strong>: the physician’s freedom to make independent decisions in the best interest of patients and for the good of society. <strong>Altruism</strong>: the unselfish regard for, or devotion to, the welfare of others. <strong>Trustworthiness</strong>: worthy of trust, reliable. <strong>Integrity and honesty</strong>: firm adherence to a code of moral values; incorruptibility. <strong>Morality and ethics</strong>: to act for the public good. <strong>Caring and compassion</strong>: a sympathetic consciousness of another’s distress together with a desire to alleviate it. <strong>Insight</strong>: the ability to recognize and understand one’s actions, motivations and emotions. <strong>Openness</strong>: the willingness to hear, accept, and deal with the views of others without reserve or pretense. <strong>Respect for the healing function</strong>: the ability to recognize, elicit, and foster the power to heal inherent in each patient. <strong>Respect for patient dignity and autonomy</strong>: the commitment to respect and ensure subjective well-being and sense of worth in the patient and recognize the patient’s personal freedom of choice and right to participate fully in his or her own care. <strong>Presence</strong>: to be fully present for a patient without distraction and to fully support and accompany the patient throughout care.</td>
</tr>
<tr>
<td>Healer</td>
<td><strong>Competence</strong>: to master and keep current relevant knowledge and skills. <strong>Confidentiality</strong>: to not divulge patient information without just cause. <strong>Autonomy</strong>: the physician’s freedom to make independent decisions in the best interest of patients and for the good of society. <strong>Altruism</strong>: the unselfish regard for, or devotion to, the welfare of others. <strong>Trustworthiness</strong>: worthy of trust, reliable. <strong>Integrity and honesty</strong>: firm adherence to a code of moral values; incorruptibility. <strong>Morality and ethics</strong>: to act for the public good. <strong>Caring and compassion</strong>: a sympathetic consciousness of another’s distress together with a desire to alleviate it. <strong>Insight</strong>: the ability to recognize and understand one’s actions, motivations and emotions. <strong>Openness</strong>: the willingness to hear, accept, and deal with the views of others without reserve or pretense. <strong>Respect for the healing function</strong>: the ability to recognize, elicit, and foster the power to heal inherent in each patient. <strong>Respect for patient dignity and autonomy</strong>: the commitment to respect and ensure subjective well-being and sense of worth in the patient and recognize the patient’s personal freedom of choice and right to participate fully in his or her own care. <strong>Presence</strong>: to be fully present for a patient without distraction and to fully support and accompany the patient throughout care.</td>
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APPENDIX C: AN EDUCATIONAL FRAMEWORK FOR CURRICULAR RENEWAL

Although many educational theories could be applied to our curricular vision, we have chosen situated learning (Brown et al, 1989; McLellan, 1986) as an overarching framework for curricular renewal and implementation. Principles of adult learning and experiential learning are also pertinent to this vision and will be described briefly.

SITUATED LEARNING

Situated learning is based upon the notion that knowledge is contextually situated and fundamentally influenced by the activity, context, and culture in which it is used. (Brown et al, 1989) This view of knowledge as situated in authentic contexts has important implications for our understanding of teaching and learning medicine as well as the design and delivery of instructional programs and activities. Situated learning theory brings together the cognitive base and tenets of experiential learning that are needed to facilitate the acquisition of knowledge, attitudes and skills. It also helps to transform knowledge from the abstract and theoretical to the useable and useful (Cruess and Cruess, 2006), as it bridges the gap between the “know what” and the “know how” of teaching and learning. The proponents of situated learning suggest that there should be a balance between the explicit teaching of a subject and the activities in which the knowledge learned is used in an authentic context – both essential principles in the teaching and learning of medicine.

Some of the key components of situated learning, detailed below, include: cognitive apprenticeship; collaborative learning; reflection; practice; and articulation of learning.

Cognitive apprenticeship builds on the traditional form of learning through apprenticeship and consists of four distinct phases: modeling, scaffolding, fading and coaching (all of which will be described below). In traditional apprenticeship, the expert shows the apprentice how to do a task, watches as the apprentice practices portions of the task, and then turns over more and more responsibility until the apprentice is proficient enough to accomplish the task independently. (Collins et al, 1991) Cognitive apprenticeship differs from this more traditional approach in that the process of carrying out the task that is to be learned is not always observable; learning is not always situated in the workplace (and the value of the final product is not always evident); and transfer of skills to new situations is required. Thus, in order to translate the model of traditional apprenticeship to cognitive apprenticeship, teachers need to identify the processes of the task and make them visible, or explicit, to the student; situate abstract tasks in authentic contexts, so that students understand the relevance of the work; vary the diversity of learning situations; and articulate common aspects so that students can transfer their new knowledge and learning to new situations. (McLellan, 1986)

In modeling, the learner observes and then mimics the teacher in the performance of a task. Modeling is most effective when teachers make the target processes visible, often by explicitly showing the learner, or apprentice, what to do. Through modeling, students observe normally invisible processes and begin to integrate what occurs with why it happens. (Choi et al, 1995) The importance of role modeling is also closely tied to this component of situated learning.

Scaffolding refers to the support teachers give the learner in carrying out a task. This can range from almost doing the entire task to giving occasional hints as to what to do next. Scaffolding supports and
simplifies a task as much as necessary to enable learners to manage their learning, allowing them to accomplish otherwise difficult tasks with optimal challenge. Too little challenge will prove boring; too much challenge will foster frustration. (Brandt et al, 1993) By supporting the integration of established understanding and know-how, scaffolding facilitates the transfer of what students already know to the task at hand. (Harley, 1993)

Fading is the notion of slowly removing support, giving the learner more and more responsibility. It is a critical step in the trajectory of becoming an independent practitioner.

Coaching is the thread that runs through the entire apprenticeship experience and involves helping individuals while they attempt to learn or perform a task. It includes directing learner attention, providing hints and feedback, challenging and structuring tasks, and providing additional challenges or problems. Coaches explain activities in terms of the learners' understanding and background knowledge, and provide additional directions about how, when, and why to proceed; they also identify errors, misconceptions, or faulty reasoning in learners' thinking and help to correct them. In situated learning environments, advice and guidance help students to maximize use of their own cognitive resources and knowledge, as in many ways these strategies are non-directive. (Choi et al, 1995)

Collaborative learning is another important feature of situated learning and cognitive apprenticeship. Brown et al (1989) have identified the following strategies to promote collaborative learning: collective problem-solving; displaying and identifying multiple roles; confronting ineffective strategies and misconceptions; and developing collaborative work skills. Small group work, peer teaching and group projects can also facilitate the acquisition of collaborative skills. As interprofessional teamwork is an essential component of medical practice, the value of incorporating collaborative learning into a variety of contexts is self-evident.

Reflection, an essential ingredient of situated learning, has received increasing attention in the medical literature (Schön, 1983); it is also viewed as a core skill in professional competence. (Epstein and Hundert, 2002) In practice, there are three kinds of reflective activity. Schön (1983) describes a spontaneous reaction (i.e. ‘thinking on your feet’) as “reflection in action.” This type of reflection, which is frequently described as a subliminal process of which the participant is only partially aware, most likely involves pattern recognition; as well, it is usually triggered by recognition that “something doesn’t seem right.” (Hewson, 1991; Schön, 1983) Thinking of a situation after it has happened and initiating the ability to re-evaluate the situation is referred to as “reflection on action.” This type of reflection, in which the participant is fully aware of what has occurred, allows the participant to mentally reconstruct the experience, paying particular attention to context. Reflection on action also forms a bridge between the re-lived situation and knowledge retrieved from internal memory or other external sources. (Robertson, 2005) While the development of the capacity to reflect “in” and “on” action has become an important feature of medical practice, “reflection for action” (Lachman and Pawlina, 2006) forms an additional avenue for professional training and improvement of practice. As Lachman and Pawlina (2006) have observed, “The process of reflection and its basis of critical thinking allows for the integration of theoretical concepts into practice; increased learning through experience; enhanced critical thinking in complex situations; and the encouragement of student-centered learning.”

Practice is another central component of situated learning. Repeated practice serves to test, refine, and extend skills into a web of increasing expertise in a social context of collaboration and reflection. (McLellan, 1996) It also enables skills to become deeply rooted and “automatically” mobilized as needed. The notion of experiential learning (outlined below) is closely tied to the concept of practice.

Articulation includes two aspects. (McLellan, 1996) First, it refers to the concept of articulating or separating out different component skills in order to learn them more effectively. An example of this is
effective communication with patients. Second, articulation refers to the goal of getting students to articulate their knowledge, reasoning, or problem-solving processes in a specific domain. By articulating problem-solving processes, students come to a better understanding of their thinking processes, and they are better able to explain things to themselves and to others. Articulation also helps to make learning – and reflection – visible.

In summary, situated learning is based upon the idea that knowledge is contextually situated and fundamentally influenced by the activity, context and culture in which it is used. Adherence to a situated learning model also leads to different perceptions of the teacher’s role. That is, teachers must assume the role of coach in addition to that of pedagogue, and they must act as models for performing learner tasks to students. (Brown and Palincsar, 1989) At the same time, students become experts and engage in reciprocal teaching (Palincsar et al, 1988), and the role of apprentice and master are shared. In many ways, situated learning (and its key components of apprenticeship, collaboration, reflection, practice and articulation of learning) provides a useful framework by which to understand how medicine can be taught and learned.

Closely tied to the notion of situated learning is the concept of “legitimate peripheral participation.” (Lave and Wenger, 1991) This social practice, which combines “learning by doing” (also known as experiential learning) and apprenticeship into a single theoretical perspective, is the process by which a novice becomes an expert. That is, from a situated learning perspective, learners build new knowledge and understanding through gradual participation in the community of which they are becoming a part. As learners, they begin at the edge - or periphery - of the community, where because of their status as learners, they have what is called “legitimate peripheral participation.” (Robertson, 2005) Mann (2006) provides a useful example. As students in a clinical rotation, or residents at the beginning of their training, gain experiences, they slowly become involved in a community of physicians. They gradually participate in more of the community’s work, and they move from the periphery towards the centre. They also take on increasing responsibility for the work of the community, namely the care of patients. In the process, they learn to “talk the talk” and “walk the walk”. A key element of participation in the community is the opportunity to see and participate in the framing of problems and understand how knowledge is structured. According to Wenger (1998) social participation within the community is the key to informal learning. It is embedded in the practices and relationships of the workplace and helps to create identity and meaning. It also complements, and can substitute for, formal learning mechanisms. Informal learning is often not acknowledged as learning within organizations; rather it is typically regarded as being “part of the job” or a mechanism for “doing the job properly”. However, “learning at work” is a key component of medical education, and there is value in rendering this learning as visible as possible so that it can be valued as an important curricular component.

PRINCIPLES OF ADULT LEARNING

Knowles (1985; 1989) first introduced the importance of principles of adult learning and the concept of andragogy, defined as “the art and science of helping adults learn”. Key aspects of these principles include the following:

- Adults are independent.
- Adults come to learning situations with a variety of motivations and definite expectations about particular learning goals and teaching methods.
- Adults demonstrate different learning styles.
- Adult learning often involves changes in attitudes as well as skills.
- Most adults prefer to learn through experience.
- Much of adult learning is “relearning” rather than new learning.
• Incentives for adult learning usually come from within the individual – and feedback is usually more important than tests and evaluations.

In reviewing these principles, it appears that medical students are on the threshold of adult learning, as many of these notions apply to them as they progress in their transition from layperson to physician. Kaufman et al (2000) have outlined a number of recommendations for program planning based on principles of adult learning that are relevant to our curricular implementation. To paraphrase these authors, teachers and educators should try to:

• Establish an effective learning climate, so that learners will feel “safe” and be able to express themselves without judgment or ridicule.
• Involve learners in the planning of curricular content and methods, to enhance “buy in”, collaboration and relevance.
• Enable learners to diagnose their own needs and formulate their own learning objectives, to ensure motivation and meaningful learning.
• Encourage learners to identify available resources and devise strategies to achieve their objectives.
• Help learners to carry out their learning plans and try to ensure successful completion of necessary tasks.
• Involve learners in the evaluation of learning, an essential step in self-directed learning.

In many ways, adult learning theory “offers us a means of thinking about student learners in a way that is consistent with what is known about learning and development.” (Kaufman et al, 2000) The incorporation of these principles also enhances receptivity, relevance and engagement.

THE EXPERIENTIAL LEARNING CYCLE

Kolb and Fry (1975) have provided a description of the learning cycle that highlights the role of experience in the learning process. More specifically, they describe how experience is translated into concepts, which in turn guide the choice of new experiences. (Boud et al, 1985) In this model, which should be considered in the design of all instructional events, learning is viewed as a four-stage cycle (outlined in Figure 1). Immediate concrete experience is the basis for observation and reflection; observations are then assimilated into a personal theory, from which new implications for action can be deduced; and all of these steps eventually lead to new experiences. According to Kolb and Fry (1975), learners need opportunities to experience each step of the learning cycle. That is, they need the ability to experience diverse situations (in both the classroom and the clinical setting); observe and reflect on what they have learned (often in a large group session); develop their own theory and understanding of the world; and experiment new ways of being in order for learning to occur. Attention to the experiential learning cycle will facilitate both the teaching and learning of medicine and ensure that different learning styles are respected and nurtured.

CONCLUSION

In conclusion, it would appear that many of the suggested goals and strategies of curricular change outlined in this strategic plan are supported by principles of situated learning (and its emphasis on learning in authentic contexts), adult learning (and its focus on self-directed learning), and experiential learning (and its attention to different learning styles). The value of a conceptual framework for teaching and learning (e.g. Physicianship), supported by cognitive and experiential learning opportunities that are grounded in available evidence and a community of practice (and learners), is also reinforced by this educational framework.
FIGURE 1

The Experiential Learning Cycle
(Kolb and Fry, 1975)
APPENDIX D: EDUCATION DESIGN GROUP TERMS OF REFERENCE

- Should McGill respond to the societal need for generalist training? If yes, how?
  - Should there be an earlier integration of generalist care (family medicine)?
  - How can we incorporate this type of training into the research-intensive McGill University and Faculty of Medicine?
  - How do we reconcile this with the movement of our affiliates towards tertiary and quaternary care?

- Should McGill continue to deliver medical education in the same way?
  - What curricular changes and alternative methods of training should we consider (i.e. competency-based education; technology-enhanced instruction)?
  - Should we continue the model of pre-clinical (Bas is of Medicine) followed by clinical training?
  - Should we consider alternative methods for content delivery and clinical training exposure (i.e. types of clinical training sites, online modules, simulation)?
  - How can we promote evidence-based education?

- How do we ensure that our students are best trained to function in an inter-professional milieu? How can we integrate learning across sites, disciplines and professions?

- Is there a better passage into the practice of medicine other than the traditional (pre-med, CEGEP, medical school, residency)?

- How can we encourage lifelong and self-directed learning?

- How can we facilitate the allocation of trainees to McGill RUIS and the infrastructure needed to support its activities? How do we promote and link the priority areas of McGill RUIS with our current and future activities?

- How do we ensure that any changes made in the educational mission are done in collaboration with:
  - Faculty of Medicine community (faculty, staff, students)?
  - McGill University?
  - Affiliated institutes?
  - Montreal and the surrounding community?
  - Government (provincial and federal)?
  - Organizations, such as FMOQ, FMSQ, FMEQ, FMRQ? CMQ, RCPSC, AAMC and AFMC?

- In the areas of faculty development, the Centre for Medical Education, and continuing medical education, how can we continue to meet the needs of Faculty, promote excellence and expand scholarship?

How can we foster social accountability and responsibility?


