The IMS „International Medical School“

A new kind of medical school for new circumstances

Conceptual Overview and Educational Perspective

Curriculum Committee

Michael Stark, Werner Seebauer, Hillard Jason, Tom Schneider, Christian Breymann

resumed by H. Jason

IMS Educational Concept and Plan
Executive Summary

This is a proposal for a new kind of medical school. In too many of the world's medical schools there are serious shortcomings in both *what* is taught and in *how* it is taught, to the *ultimate detriment of the cost and quality of healthcare*. Most medical schools were designed for a far less rapidly changing world, *without the benefit of guidance* from modern educational or brain research, and without anticipating the arrival of potent, educationally-relevant technologies.

The IMS will be different in many important ways. It is designed to be continuously responsive to our latest understandings of how the human brain works, and of how people learn. And, we will take full advantage of the best available educational-support technologies. **This will be the first medical school to do <u>all</u> of the following:**

1. Make a large investment in **teacher development** for *all of its teachers*.
2. Undertake **extensive assessments** *of all incoming students* so that their educational experiences can be customized and continuously adapted for their unique combinations of backgrounds, strengths, and evolving needs.
3. Avoid **the inappropriate legacy practice** of pre-determining the specific experiences and duration of time that all students must follow.
4. Prepare students to **think and function as scientists***,* rather than merely have them take courses that get them to temporarily memorize the products of science.
5. Arrange a **highly individualized and adaptive array** of learning opportunities, including real clinical responsibilities, carefully chosen to prepare them for *community-focused, front-line, team-based, cost-conscious* care.
6. Systematically design educational experiences that will help graduates be optimally prepared for **adapting to a changing, unpredictable future**.
7. And much more, as explained in the following proposal.

Some observers will regard our plan as highly innovative, perhaps radical. We consider most of our plans as **needed corrections of outdated educational traditions**. Many of these "corrections" and innovations involve implementing more fully and more systematically educational approaches that can be found, in part, in progressive medical schools in the UK and other countries, As we will explain, 14 educational traditions remain strongly influential in many medical schools. These traditions make much of conventional medical education less efficient and less effective than it could be.

After reviewing the following pages we hope you will agree that the IMS is being more carefully planned than most medical schools have been. We think it is the first to be built on a foundation of solid evidence, rather than on unexamined traditions and unfounded assumptions. We hope you will come to agree that the prospects are good that the IMS can become **an important, influential institution**.

The IMS Concept and Plan

An important note about educational innovation

Some observers might regard the following plan as highly innovative, perhaps radical. In our view there is not a great deal of innovation here. Rather, most of what we're proposing are *needed corrections of outdated educational traditions*. And, many of these corrections involve implementing educational approaches that aren't new. They have been developed and validated elsewhere. Many of them can be found in medical schools in the UK and other countries, and some are in use in non-medical-education settings. At this time, however, we're not aware of any medical school in which all of these approaches are being pursued as fully, or all at once. And, we do propose a few approaches that we don't think exist yet in any medical school. All of the corrections and innovations we propose *are supported by solid educational research and brain science.*

Why develop a new kind of medical school now?

Most of the world's medical schools and teaching practices were designed for a far less rapidly changing world, *without the benefit of guidance* from modern educational or brain research, and without anticipating the arrival of powerful, educationally-relevant technologies, especially the Internet and the potent resources it now makes possible.

In too many of the world's medical schools there are serious shortcomings in both *what is taught* and *how it is taught*. The following are some of our **outdated traditions** that are **most in need of correction**:

1. Much teaching and testing continues to expect **large amounts of memorization**, despite the confirmed, serious limitations of human memory, the wide availability of memory-support technology, and the likelihood that much of what we expect students to remember will be *irrelevant for their careers*.
2. Excessive attention is given to cognitive content, and **insufficient attention to cognitive skills**, such as information searching and assessment, problem analysis, and complexity management.
3. The teaching in many programs **is dominated by** large, impersonal class sessions with uninterrupted lectures. Most of these events accomplish little educationally, and often do harm by creating a distorted sense of the teaching-learning process. The evidence is clear, as we've known for a long time, **we need to shift** from "the sage on a stage" to "the guide by our side".[1]
4. Too often, **students are denied opportunities to practice doing for themselves** the cognitive, emotional, and performance tasks they need to learn. Instead, **we keep them passive** for long stretches of time, having them merely read about, or hear about, or observe others doing those tasks.

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[1] King, A, (1993) From Sage on the Stage to Guide by the Side, College Teaching 41: 30-35

5. In many programs, we **standardize** the kinds and duration of the experiences we offer, ignoring the **enormous diversity among learners**, such as: the residuals from their prior learning, their cultural heritage and established assumptions, their personal values, their readiness for the learning approaches we expect them to follow, and their capacity for taking responsibility for their own learning, among many other factors that make each learner unique. ***We need to standardize the outcomes we expect, not the process or the time for achieving them.***
6. We move students from class to class, discipline to discipline, often hour-by-hour, providing **insufficient time for reflection, discussion, practice**, or other steps needed for integrating their experiences and achieving lasting learning.
7. We postpone both **our assessments of students** and the **limited feedback** we offer until it is *too late to exert a constructive influence on their learning*.
8. Most programs assess their students, but few help them learn the *vital attitudes and skills* needed for a lifetime of **accurate self-assessment**, based on **constructive reflection**, which are core elements of **learning from experience**.
9. Few programs give **sufficient attention to other skills and attitudes** (such as goal-setting, progress monitoring, openness to being observed/critiqued by others) which are needed for a lifetime of effective learning and constructive change.
10. We largely **neglect social and emotional competencies**, despite their central importance to the effectiveness and outcomes of intimate, human-oriented work, such as healthcare and teaching.
11. We focus primarily on **having students learn to intervene in the late stages of illness**, with insufficient focus on helping them develop the attitudes and skills needed for promoting health and preventing illnesses (with profound, negative consequences for the cost and effectiveness of healthcare).
12. A large proportion of **clinical learning is based in in-patient settings** despite the fact that most physicians provide most clinical care in ambulatory settings.
13. Most programs **do little, if anything, to ensure that those selected to teach** are actually competent teachers and are adequately prepared for this important, challenging, complex professional work.
14. Commonly, our approach to selecting and rewarding faculty members (for which we focus most on clinical experience and/or research productivity), reflects and perpetuates our **devaluing of instructional competence**.

Our planning for the IMS educational program will seek to overcome these and other legacies from the past, replacing them with the best of what we now know to do.

Some positive current circumstances relevant to our goals

The accreditation process. The climate for constructive innovation in medical education is more hospitable now than it has ever been. Accreditation groups and senior educational leaders are shifting away from their prior approach of

seeking to enforce standards by stipulating characteristics of the instructional program, even the hours and topics that all medical schools must offer. Now, instead of prescribing the instructional details, more emphasis is given to the **outcomes** that are desired. The UK's **General Medical Council** is a leader in this regard. **See Appendix A** (page 14) for their list of recommended outcomes, which is serving as one of the key guides for our planning.

The Bologna Process. The creation of the Euro Zone, and the agreements reached in the Bologna Process are lowering former barriers to medical migration among European countries. Given the possibilities that an increasing number of physicians will be educated in one country but practice in another, there is a need for models of how best to design and offer appropriate medical education for this situation. We need programs that succeed in preparing future physicians who will have the foundation required for being effective clinicians in a variety of contexts, and who will continue adapting appropriately to changing circumstances. We propose that we now need a new kind of medical school that is specifically oriented to providing an educational program that is explicitly designed with these and other new realities (explained below) as guiding conditions.

The current explosion in the amount and quality of brain science. Thanks largely to powerful new imaging techniques, our understandings of the functions and limitations of the human brain have been expanding at a dazzling pace. We can now assert with more confidence than ever before **what works and what doesn't** in educational design and implementation. Among many other insights, we must now accept that our **expectations for students to memorize** information they aren't using regularly in current, real-world tasks is inappropriate. Similarly, we can assert that students need **a sense of emotional connection** to the material we expect them to learn. *We are now in the strongest position ever for designing new, evidence-based educational programs*.

The large and growing need for generalist, adaptable, cost-conscious physicians. Perhaps paradoxically, the near crisis problems in healthcare related to personnel and resource shortages in many regions emphasize the need for developing the new kind of medical school we are proposing. In Europe, as in other parts of the world, there are places with serious shortages of front-line physicians who have capabilities that are not now common. Physicians need to be: expert at the highly difficult task of sorting through undifferentiated, often multi-faceted clinical problems; sensitive to the characteristics and needs of the population they are serving in their local community; equipped to collaborate constructively as part of a modern healthcare team; and well prepared to achieve efficiencies, while continuously adapting to changing circumstances. We intend to graduate physicians who are optimally suited for current conditions, while being able to adapt appropriately to whatever changes may be associated with any moves they may make to other locations, and to whatever the future may bring.

The need for a test-bed of future medical education. Despite the best intentions and efforts of imaginative, informed leaders in many existing medical schools, repeated experiences in many countries confirms how difficult it is can be to create and sustain **significant departures from the traditions of the past**. Established schools have usually had the seriously constraining influence of being dependent upon faculty members *who are unready to move too far from their own prior learning and teaching patterns*. Even new medical schools have typically not had the will or the resources to make the initial investments needed for preparing their faculty for significant departures from past practices. We are exquisitely sensitive to the size of the challenge we face in seeking to design and develop a new kind of medical school. **The following will be our approach:**

a. We will make **the largest investment ever in medical teacher preparation.** We will prepare virtually all of the school's teachers in ways that will help ensure their **informed, shared commitment** to the goals and approaches of this different kind of educational program. And, we will devote extended time to providing repeated opportunities for developing and refining the *attitudes, understandings and skills needed for being the kind of teacher that this program will require.*
b. We are persuaded that there are faculty members scattered among current medical schools who are eager for the kinds of **teaching opportunities** that will be available at the IMS. Once our intentions and approaches are known and understood, recruitment should not be difficult.
c. We expect there are other programs that will regard the IMS's **carefully monitored and researched approaches** as attractive opportunities for **collaborative research**. We anticipate that others will join us in gathering evidence that may help accelerate the appropriate planning of changes that may be needed in their own and other programs.
d. We intend to devote significant efforts to learning from and helping others, as best we can. Toward these ends, we will seek **a close relationship with AMEE**[2] so that we can learn from their knowledgeable and experienced members, and so that we may contribute to that organization's leadership in international medical education.

The major goals of the IMS educational program

We recognize we are undertaking an ambitious project. On the surface, in contrast to many traditional medical schools, these plans may appear radical. Yet, those of us with long experience in medical education planning and reform are persuaded that our intentions are not only achievable, they are overdue and mainly involve doing what is already being done, at least in part, in some of the more progressive institutions in

[2] The Association for Medical Education in Europe

several countries. We think that our pursuit of all these goals from the outset, and doing them all at once, is what *may* make this medical school distinctive and important.

Our dominant goals are:

1. **Create a model of 21st Century medical education** that will offer the highest possible quality learning experience for our students. We will find ways to graduate sensitive, effective, humane, scientifically-grounded physicians who will spend their careers continuing to learn, adapt and change, as needed, in response to changing understandings and circumstances.
2. **Develop a carefully researched medical education approach** that can contribute to guiding the design of other new medical schools and appropriate reforms being pursued by existing schools.
3. **Devise an improved approach to conceptualizing and designing curriculum**. There is strong evidence that learners are far more diverse than has generally been recognized or responded to by traditional medical education. We consider it **indefensible** to design educational programs that specify *a standard number of experiences, even the number of hours*, that all students will spend in those experiences, before new students have even arrived. That's like planning specific surgeries for patients who haven't come to the clinic yet! As clinicians we do a diagnostic workup of each patient, and we formulate individualized clinical recommendations. Similarly, we will gather detailed information about each student, enabling us to jointly devise an essentially unique pathway for each one. Our goal is to have an educational program in which *each student's curriculum will be unique*. We will have common outcome goals for all students, aiming to fulfill the **GMC's specifications** (see **Tomorrow's Doctors**) and others we feel are needed. There will be **many ways** of reaching those goals.
4. **In addition to the goals defined by the GMC's outcomes expectations**, we have the goal of producing graduates who will **adapt constructively to an unpredictable future**. This goal involves doing all we can to foster the understandings, skills and attitudes needed for our graduates to be dedicated and accomplished learners, but it goes beyond the usual intention of graduating lifelong learners. Our goal will require experience and comfort in dealing with ambiguity and with disruptive, basic changes in work and life circumstances.
5. **Make the process of selecting and developing those who will serve as teachers** a central part of the school's design from the outset. We will choose teaching-faculty members for their deep commitment to high quality medical education and their willingness to participate in an intensive teacher-development program early in their affiliation with the school, and in "refresher" experiences throughout their time as teachers in this school. Part of this goal will be creating a culture in which *providing education and studying the educational process* will be highly respected, and rewarded appropriately.

6. **Invest early and substantially**, and seek collaborators at other schools, in pursuing a sophisticated program of ongoing educational research, both to guide this school's continuing evolution and to provide contributions to those at other medical schools who share our goal of having *evidence replace habit and tradition as the basis for decision-making in medical education.*
7. **Buy, contract for, and/or design and implement the latest, highest quality, educationally-relevant technology** in support of a maximally individualized learning experiences. This technology will be used actively for *adaptive e-learning*[3] (for both students and faculty), communication, administrative management tasks, and simulation of a variety of situations and tasks in support of learning and planning.
8. **Design and implement a set of learning experiences** that are consistently focused on graduating the kinds of physicians summarized in the GMC's specifications of desirable outcomes (see Appendix A, page 14), and more, while consistently adhering to the following **key educational principles**:
    - Each entering learner's **first experiences will include a thorough "diagnostic workup"** in which we and they will come to understand the educationally-relevant information of who they are, including multiple aspects of their existing strengths and needs, and their learning readiness. In the process, the practical exercises in which the students will engage will provide them with a meaningful orientation to the processes of learning medicine and of becoming a clinician. A thorough effort will be made to know and understand the unique characteristics of each student in sufficient depth from the outset, and repeatedly throughout the program, for optimal educational planning during their time in this medical school.
    - Carefully guided, appropriately gathered information about the learners' experiences will be **assembled and reviewed on a continuing basis** throughout their education. This growing body of information will serve **three primary purposes: "diagnostic", "formative" and "summative".** That is, the learners and their advisors/mentors will regularly monitor the learners' progress in pursuing the program's and their own goals. The learners will receive regular feedback on their progress and they will have dependable guidance on what they should be doing next. In this context there will be no need for end-of-term or end-of-year summative assessments. When needed, summative decisions will be made more reliably on the basis of the substantial, accumulated record of the learners' achievements throughout their program than can be determined from single-episode, high-stakes, time-

[3] An online, computerized process in which the learning tasks and expectations change continuously in response to learner performance.

limited formal examinations. And, in any case, in our highly individualized program, there won't even be a common end-of-term or end-of-year.

- **Conventional, assigned grades will not be used**. These labels are *over-simplified summaries of highly complex situations*. They make no positive contribution to learning, and don't belong in a modern educational program.
- As in good PhD programs, **no value judgment will be assigned to the time taken** in reaching outcome goals. Outside limits will be set on what will be considered reasonable maximum times for reaching each major "milestone" along the way toward completion of the program. (Extenuating circumstances will be considered, so these limits may be extended at times.)
- Despite our careful selection process, **some students may prove to be unsuited for a medical career**. If we've done our job, they will respect the evidence and withdraw voluntarily. They will understand there is no shame in doing so. Not everyone who sets out to become a professional musician or a professional athlete, or a physician, finds joy and success in the process. Voluntarily withdrawing and seeking an alternative, perhaps related, career, can be a mature, responsible decision.
- Primary emphasis, in both instruction and assessment, will be given to the learners' approaches to **identifying and managing relevant information**, not to its acquisition.
- To the extend possible, the **responsibilities for learning will be shifted to the learners**. The faculty will serve primarily as guides, coaches, mentors and facilitators, not as information-dispensers. This program won't have succeeded if the students aren't excitedly motivated to work hard and to learn as much as they can of what they perceive as engaging, career-relevant material. They will be striving to meet *their own high expectations*, not ours.
- **Teacher-student relationships** will be models of the supportive, considerate, nurturing connections we want the learners to have with their current and future patients. All teachers should be **seen by their students as their advocates**, never their adversaries.
- The **dominant learning events** will involve one-to-one mentoring; small-group collaborative learning; and individualized, technology-supported self-instruction. Large group gatherings will be primarily for ceremonial events and for occasional exposure to important visitors.
- **Communication and other interpersonal skills** will be considered central parts of all educational encounters, whether with teachers, patients, peers, or others, and will be important elements of ongoing self-assessments as well as formative assessments and guidance.

Some key questions and answers (kept brief for this introduction)**:**

1. **Do you anticipate any resistance to this plan?**
   - In the past we would have expected a great deal of resistance. Today, some of our proposals may seem unfamiliar, even strange, to educators who aren't in touch with the leading-edge developments at the more progressive medical schools. There are likely some who respond to unfamiliar ideas, as ours might be for them, with concern, even resistance.
   - We also recognize that proposed departures from the norm, even the most worthy of innovations, can be viewed as criticisms of existing approaches. Understandably, not everyone takes kindly to perceived criticism.
2. **Which proposals do your expect some people will find difficult to accept?**
   - Whenever departures from established patterns are proposed, the ideas that are most likely to be questioned are those that are least conventional. For people who are not familiar with recent developments in medical education or with educational and brain research, our least familiar proposals are most likely:
     - the non-standardized, highly variable curriculum
     - the absence of any formally-defined "courses"
     - our plan to not stipulate in advance how much time all students will spend on any given "subject" or in the total program
     - our encouraging students to assume growing amounts of responsibility for designing and controlling aspects of their own learning experiences.
3. **How do you plan to try overcoming these concerns, if any arise?**

   Although we don't harbor the illusion that we will successfully win supporters among everyone who learns about this program, or even among all those who are in a position to judge (and accredit) its acceptability, we hope to earn a good number of supporters in three ways:

   - **First**, we expect to have some **immediate supporters** among those who learn about our program, since few of these concepts or approaches are entirely new and some have been in growing, if partial, use for years.
   - **Second**, as needed, **we will provide additional rationale and evidence** supporting each of our proposals. We will also gladly meet with any group in a position of influence that expresses a request for clarifications or justifications. We think we can make a stronger case, if needed, than we've taken room for in this introductory, overview document.
   - **Third**, we are **eager to learn** and are fully open to making changes in any aspect of these plans for which persuasive evidence of the need to do so is offered.

4. **You haven't mentioned seeking currently active researchers as faculty members. Won't this seriously weaken your educational program?**
    - Our first priority is finding and cultivating **the highest quality educators**. As indicated in our answer to #5, below, we expect a meaningful proportion of our teachers will be people who are actively engaged in scientific careers, in basic biological, psychosocial, and clinical domains.
    - We want to emphasize, however, that the conventional practice of assigning time for exposure to each of the long-ago defined "basic science" disciplines is irrelevant for today's and tomorrow's physicians. Most **worthy research** now being done crosses several of the old boundaries.
    - We see no point in seeking to perpetuate the outdated discipline orientation that still lingers from the past in many medical schools. Our focus will be on the *processes* and *mindsets* of science, with **reduced emphasis** on having students memorize the outcomes of old science.
5. **Won't students who don't take systematic courses in the basic sciences be too weak scientifically to be safe clinicians?**
    - The available evidence indicates that traditional medical education, which includes a lot of time in basic science courses, **isn't succeeding** in producing scientifically well-grounded physicians.
    - We are persuaded that becoming scientifically grounded has little to do with being able to remember the products of science, as is still a large part of some traditional medical school basic science courses.
    - Our approach to fostering a scientific sensibility, and a scientific approach to medical practice, will involve experiences working with teams that are doing re*al scien*ce (much as learning to be a clinician derives best from working with teachers who are providing real clinical care). Such teams will need to have members who are **effective educators**, who will draw attention to, and **be role-models** of the key components of **doing science:** asking worthy questions, reviewing the literature critically, thinking and deliberating, weighing evidence, being aware of the tentativeness of all "conclusions", and other elements of the *process* of being a scientist. We anticipate having all of our students spend extended periods of time as working members of more than one such team.
6. **Isn't there some basic information, some "core knowledge," that all physicians need? Good thinking can't be done in a vacuum, in the absence of relevant information.**
    - True, but information isn't static. And clinically-relevant information not only changes rapidly but highly different information is needed in different

contexts at different times, even in the same clinical specialty, and even more so across clinical specialties. Clinicians aren't made safe by having once known information that is no longer relevant to their work, or that may even be incorrect for current use. **Clinicians are made safe** by being: deeply respectful of their own limits, by not trusting their memory for anything that they aren't using regularly, by being authentically expert at continuously learning and seeking new understandings, and by being equipped to take optimal advantage of the latest **memory-support** and **decision-support** technologies… all of which will be among the core areas of focus in this medical school.

- Our program will take advantage of currently available technology for **carefully monitoring** each student's experiences. We will help ensure that all students are involved in those research and clinical situations that **compel them to be exposed** to an appropriate range of relevant information. Inescapably, as an outcome of their daily activities, **our students will assimilate a great deal of information**. The key point is that they won't be accumulating information for its own sake or without a meaningful context. Their learning will grow out of the contexts in which they work, and will be deeply (emotionally) valued by them because it is tangibly relevant to their concerns. (Among the many insights we now have about the human brain is that it is woefully unreliable at retaining, and having dependably available for future use, information that wasn't meaningful and valued when acquired, and isn't being repeatedly used.)
- Our students' pursuit and acquisition of information will be linked to valued motivations, derived from their daily, real experiences.

7. **An overall characteristic of this educational plan seems to be a reduction or elimination of the usual sense of control that teachers and administrators have over the curriculum and over students. Won't this lead to chaos?**

    - That is an understandable concern, which serves to emphasize an overriding premise of our approach to education.
    - In brief, a central feature of **good professional education** is providing learners with maximally real opportunities to practice, during learning, those attitudes, skills, and capabilities needed for their careers.
    - To produce mature professionals, we need to provide maximum opportunities for them to **practice *being* mature professionals** as soon and as consistently as possible. Whenever we control learners we deny them an **opportunity to make their own decisions** and to learn from the consequences.

- Giving students opportunities to **make decisions and to learn from their mistakes**, even serious ones, is only possible, especially in their early development, if the learners are closely monitored, and if the experiences in which they engage are **carefully calibrated** to be appropriate for **their levels of readiness** (beginning with simulations, not real patients). Those conditions will be central elements of this medical school's design and approach, and are now made possible through the appropriate use of available technologies coupled with extensive teacher preparation.

8. Why haven't you defined a conventional curriculum statement, with elaborate flow charts, as most new schools do?

- That's an important question. But the answer, if not already evident from what we've provided above, is quite complex.
- Rather than make this introductory document even longer than it already is, we've relegated our fuller answer to a separate document (please see **Appendix B**, page 15).

9. Your proposal seems dependent on a lot of technology, procedures, and approaches that aren't likely to be readily available for quick acquisition and use. Won't it take years before this program is ready for students?

- Yes, we will need to invest a lot of time and effort in **defining, acquiring, and inventing** the resources needed for this new kind of medical education. Although we plan to do a good deal of initial planning of those components (probably taking *at least* one to two years), we explicitly want our faculty members and our students to be **active participants** in the further definition, selection, design, and creation, of these resources, as well as in the ongoing, never-ending assessments and revisions of these approaches and resources.
- We're persuaded that understanding the need for these approaches and resources, and participating directly in their design and continuous refinement, will bring important contributions to achieving a key element of lasting learning: we will be helping cultivate **an authentic sense of "ownership", a positive emotional connection** with the program's goals and desired outcomes. This process will help cement the teachers' and learners' sense of connection to the institution and to the educational experience. In other words, *the process of being a teacher or learner in this environment, and having responsibilities for assessing and enhancing that environment, are key components of our overall educational plan.*

We want our teachers and students to feel like authentic co-creators of this institution, not just minimally-involved transients who are passing through for a while.

Appendix A

The duties of a doctor registered with the General Medical Council[4]

Patients must be able to trust doctors with their lives and health. To justify that trust you must show respect for human life and you must:

- Make the care of your patient your first concern
- Protect and promote the health of patients and the public
- Provide a good standard of practice and care
  - Keep your professional knowledge and skills up to date
  - Recognise and work within the limits of your competence
  - Work with colleagues in the ways that best serve patients' interests
- Treat patients as individuals and respect their dignity
  - Treat patients politely and considerately
  - Respect patients' right to confidentiality
- Work in partnership with patients
  - Listen to patients and respond to their concerns and preferences
  - Give patients the information they want or need in a way they can understand
  - Respect patients' right to reach decisions with you about their treatment and care
  - Support patients in caring for themselves to improve and maintain their health
- Be honest and open and act with integrity
  - Act without delay if you have good reason to believe that you or a colleague may be putting patients at risk
  - Never discriminate unfairly against patients or colleagues
  - Never abuse your patients' trust in you or the public's trust in the profession.

You are personally accountable for your professional practice and must always be prepared to justify your decisions and actions.

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[4] **From,** General Medical Council (2009) ***"Tomorrow's Doctors"*** (page 1)

Appendix B

Why haven't we provided a conventional "curriculum"?

The educational approach we're planning for the IMS is unlike that offered by any current medical school program we know about. Other medical schools publish a **formal curriculum:** their plan of shared activities and the sequence of events their students are expected to follow, including the main choices, if any, they may have.

We consider the notion of a single curriculum for all students to be **contrary to what education and brain research have revealed about the ways humans learn.** The evidence is clear: a single plan for all students is not what is needed. And, in fact, it is **not what actually happens in any medical school!**

A curriculum plan defines what the teachers intend to do, or what the administrators expect them to do. But ***it can't succeed in defining what each individual student needs or actually experiences***. Conventional curricula are usually based on the incorrect assumption that learning experiences are fairly straightforward and predictable. As we now realize, human learning, especially of complex, multi-faceted material, is neither straightforward nor directly controllable. Inescapably, human learning is messy, unpredictable, variable from time to time within each person and highly variable between people. **No two people react to a learning experience in the same way,** and the same person reacts differently at different times!

We certainly understand why administrators and teachers prefer having a carefully designed master plan. And, initially, the discovery that far less control is possible than had long been assumed is available can be annoying or just not believable to some administrators. *There is nothing to be gained, however, and a good deal can be lost, by imagining we have more control than we do*. **There is a better way,** as we're trying to define in our accompanying proposal.

To clarify this important principle about human learning, consider **a specific, small example**: a class of students taking a Biochemistry course. They are all sitting in the same room where a professor is delivering a lecture. We would be highly mislead if we imagined that all those students are having roughly the same experience. Given what we now understand about human learning, and especially about how our brains work, **we have to accept that every person in that room is having a unique experience.** Everyone brings to that event their own set of prior experiences, their unique biological characteristics, and their individual assumptions, values, and personalities. As teachers we must accept that just because we've said something we would be deceiving ourselves if we believed that everyone heard and understood the same thing in the same way, if they even heard it at all. And, of course, in just about every such class some number of students aren't even there.

A diagram of a 21st Century medical curriculum would need to look a little like a complex computer programming flow chart, illustrating innumerable branch points, with

an enormous number of variables, most of which are operating unpredictably. There is no way that planning can be done for the following events (to pick only a few of many possible examples): the quality of each students' sleep last night, the priorities that have been totally upended for one student who just discovered that she is pregnant, the major interruption in the lives of two students who were in a serious driving accident, let alone all **the unique features of each person's neuronal organization, which shapes how all new experiences are perceived and assimilated.** And those neuronal organizations change from moment to moment! In other words, it is simply impossible to capture in a diagram, in print, or even on a large computer screen, a proper representation of every student's pathway of learning, even in one day of medical school, let alone for a full year.

We think it would be misleading for us to offer a diagram that we claim captures the experiences a full class of medical students will be having in our school. So, we haven't tried. Instead, we will just suggest how the process might work in the real world of this new kind of medical school, as **over-simplified by the following introduction.**

All candidates for entry to this program will experience **a careful, thorough selection process**. We will come to know a good amount about each of them. We will have some confidence that those who we accept each have the potential for thriving in the experiences we will offer, but we won't yet have made the larger investment of knowing each of them in sufficient detail to guide the specifics of their learning plan. For that, after admission, we will undertake an extensive "**diagnostic workup":** our analog of the medical workup that clinicians do with each new patient in the healthcare setting.

We've defined the general outlines of our educational diagnostic approach, but not yet the specific details. **We will gather as much relevant information as possible,** from interviews, and from observations of their ways of functioning in sample one-to-one mentoring sessions and in sample small-group collaborative learning sessions. We will gather additional insights from the students' responses to questionnaires and various exercises. These exercises will include some hands-on tasks designed much like "OSCEs"[5], although without a timing clock at each station.

The **information we gather** during the diagnostic phase, as well as **the experience of the process itself,** will serve several purposes and be used in multiple ways. The students will likely derive a highly meaningful **introduction to the "culture" of the school:** the supportive, considerate, scientifically rigorous as well as humane ways in which they will be treated, and the high levels of performance that will be expected of them throughout the experiences that will follow. They will also, we expect, gain some **new insights into two important areas:** how mature learning works, and how they currently function as learners. Because of the range of diversity among them, we anticipate that there will be a fairly wide range of reactions to these experiences.

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[5] The widely used Objective Structured Clinical Examinations

Given our selection process, we expect most student reactions to be positive. But, we won't be surprised if we made some incorrect predictions during the admissions phase and that a few new students will conclude that this is not an environment in which they will function comfortably. **Some may choose to withdraw.** We consider it far better for them to make that decision during the initial weeks of medical school than a few years later, as now happens in many schools, where some students who should withdraw, choose not to at that late stage because of the large investment that they and their families have already made... leading to the annual graduation of people who don't belong in the profession, sometimes with unfortunate negative consequences.

Following the diagnostic phase **there will be a major branching,** which will take most students to some **"deficit-correction" and/or "foundation-development" experiences,** so they may have some of their areas of "weakness" strengthened, and new capabilities developed, in preparation for what will follow. We anticipate that most students will be found to need some enhancement of their readiness:

1. … to function independently a fair part of the time
2. … to be active participant-contributors in collaborative learning groups
3. … to take optimal advantage of personal tutors and mentors
4. among other relevant characteristics and competencies.

NOTE: We're not referring to knowledge deficits as those can easily be dealt with, if they need to be, with our e-learning modules. Worth emphasizing is the point that the **students will likely be assimilating a good deal of medically-relevant knowledge and understanding** from the examples we will use for their diagnostic, correction, and foundation-development experiences.

Some students may need more assistance than others in **learning to function as mature learners;** that is, as people who think in ways that enable them to **identify their own priorities, goals and interests,** and who can **formulate constructive plans** for pursuing those goals and interests. Others may need help learning to constrain their many interests. Once liberated by a program that facilitates the freedom that is needed for mature learning, some **may have to learn to postpone their initial inclinations** to pursue too many of their areas of curiosity. They will need to figure out how to choose among their many interests so as to focus productively on what they most need at that stage of their development.

The **large amount of subsequent branching** will be based on the ongoing observations by their mentors and by the students themselves, as well as from the analyses that will be possible using our ongoing data collection. Thanks to currently available technology, information will be routinely collected from the students' uses of the e-learning modules and from their experiences with their tutors, mentors and learning groups. Those data-collection systems will be fully available for review at any time by the students and by their advisors, so that **appropriate adjustments can be made,** as needed, in the learning plans they are following.

NOTE: The proper functioning of this sort of learning environment requires the same high level of trust between the students and the educational program as the GMC has emphasized is needed between clinicians and patients. In many conventional education programs trust is lacking. Students, there, seek to conceal any defects they suspect or know they have, out of concern that this information will be used against them! Those are environments that perpetuate dependency and postpone or prevent educational maturation. They are the reverse of what we are seeking to provide.

Even if we wanted to provide sample curricula, we couldn't devise real ones without knowing who our students are. As we've indicated, the experiences that students will have can't be defined until the specific students are enrolled and participating in the process. The details of each learner's pathways will emerge, organically, within their learning groups, research teams, and clinical sites where they will be spending extended segments of their time. Since all of the teachers with whom the students will work will have participated in our intensive teacher-development program, we will trust them to help build their students' experiences and opportunities in response to their daily observations of their students' performance, integrated with other available information. And all of this will happen in collaboration with the students themselves, who we can expect to have growing capacities for making mature, appropriate decisions about what they most need.

If we or others were to try conceptualizing some sample curriculum for the IMS, we would have to **keep some factors and principles in mind,** such as:

1. Since we might be admitting some students who have been in relevant prior educational programs or careers (such as nurses, managers, teachers, graduates of highly progressive schools), some will have much higher than typical levels of **this school's needed entry competencies** before they begin with us. (This, of course, further emphasizes why deciding in advance that all students should participate in the same learning tasks for the same amounts of time doesn't make sense).
2. Some of the entry competencies we will recognize or help each student being achieving early in the program, are:
   - conducting a basic, information-gathering interview
   - having the professional manner needed for helping patients and others feel reasonably at ease
   - undertaking a basic physical exam of people of different ages
   - using e-learning technology comfortably and productively
   - participating respectfully in, and contributing constructively to, collaborative learning groups
   - and much more.

There will be other capabilities that we will expect all students to demonstrate at various later stages in their time with us, such as:

- reviewing and critiquing a range of scientific articles effectively
- systematically reflecting on clinical information they gather from a patient workup
- establishing trust-based relationships with a wide-variety of patients and colleagues
- setting and pursuing high standards in all their professional activities
- and much more.

SPECIAL NOTE: Our intended educational outcomes include all of the content areas that are spelled out quite effectively, in general terms, in the body of the GMC's latest edition of **Tomorrow's Doctors**. Our monitoring systems will be continuously checking for each learner's progress in achieving appropriate levels of mastery within each of those many areas. We trust you now understand why we are unable to predict in advance when in the course of their time with us each student will reach and surpass those levels, and why each learner will be following a unique set of pathways toward those outcome goals. Unlike the fairly common practice in traditional medical education, however, we won't assume that once some knowledge acquisition or performance competency has been demonstrated it can be assumed to be retained in the future. Our monitoring processes will be regularly ensuing that critical outcomes are retained and repeatedly put to use in real applications.

Clearly, a paper-based, or even a computer-based, single flow chart can't begin to capture anything close to the full complexity of the highly individualized, multi-year medical education program we will pursue.

We hope you now understand and accept why we aren't providing a conventional curriculum plan for this medical school. *However, we must emphasize the following:*

A "curriculum" is a description of whatever is planned for a set of student experiences, PLUS many other influences on their learning that may be unplanned but are important in shaping their development, whether positively or negatively (the so-called "hidden curriculum"). A curriculum can't be, and doesn't need to be, represented on a flow chart.

Although the "messy", variable program we've outlined in our proposal could be called our "curriculum", we've hesitated to apply that label to our plans because of all the well-established associations linked to that word. For now, we assume that we and our program will be better served without using or being identified with the word "curriculum". Yet, as we hope you understand, we will certainly have a curriculum (actually, a great many!).