

Infusing the Interdisciplinary into Medical/ Health Sciences Education: Vitamins or Vaccines?

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Abstract - Academic medical institutions have responded to recent changes and challenges confronting the health care system with various recommendations for curricular reform; many grouped under the rubric of interdisciplinary training. The ultimate goal is to create physicians, with mastery over specialized knowledge, who can practice cost-effective, humanized medicine. This article elaborates a conceptual classification system that categorizes curricular reform recommendations into one of two approaches – *Vitamins* or *Vaccines* – that highlights differences in the processes of curricular reform programs. Programs seeking the same goal may create different types of practitioners depending on the approach dominating the professional training and socialization process. The *Vitamins* approach is reactive, supplemental, and incremental, often imparting instruction instead of education. The *Vaccines* approach is proactive, addresses fundamental factors, and seeks long-term solutions from a preventive perspective. As educators, our choice of approach, *Vitamins* or *Vaccines*, for curricular reform will determine how academia prepares physicians for the future.

This paper presents a conceptual framework that employs the metaphors of vitamins and vaccines to understand and classify recent efforts to change curricula in medical education. This characterization of programs, recommendations, and efforts into *Vitamins* or *Vaccines* categories clarifies the underlying philosophies and processes of training and education, and helps predict the ultimate outcome, that is how these changes in the educational sphere will translate in actual practice. For instance, two separate recommendations for curricular change may suggest the same endpoint of interdisciplinary training. However, by virtue of their being classified into either one of vitamins or vaccines approaches would enable us to see how the courses offered in each would be interpreted differently, thus influencing implementation and subsequent process of learning. This would influence the medical student and his or her future practice in highly divergent ways. Therefore, using the conceptual lens of *Vitamins* and *Vaccines* can guide practical aspects of initiation, implementation, and sustainability of curriculum reform measures, and predict patterns of practice of future physicians.

Recent changes in the health care environment, shifting alliances and organizational re-arrangements,

have not only rendered it fluid and difficult to grasp, but also imposed constraints on physicians' practice in a climate of fiscal accountability.^{1,2} There are other equally important issues influencing medical education. These include:

- rapid growth of knowledge in fields such as molecular biology and genetics;
- excessive reliance on technology for diagnosis and treatment; a system of training geared to specialization leading to rigid boundaries between disciplines;
- growing patient dissatisfaction, often unduly focused on individual physicians rather than the system of health plans; increasing emphasis on quality of life in health status measurement; and
- increased demand for choices on the part of the consumer-patient.

Future physicians wanting to practice humanized medicine face a formidable task ahead; so does academic medicine that is responsible for educating and preparing them.^{1,3,4}

In a survey of about 1400 deans, faculty members, and department heads of various medical schools nearly a decade ago, 61% of respondents believed that US medical education needed fundamental changes or thorough reform. Most believed that medical education at their own institutions had not kept pace with changes in the way medicine is currently practiced.⁵ A common complaint is that changes in the practice arena demand more collaboration on the part of practitioners. However, this need for collaborative practice skills is not being met in the sphere of training and education in the health professions.⁶ This has led to numerous reports and recommendations for change in medical education over the last two decades.⁷

One of the earliest reports was the General Professional Education of the Physician (GPEP) Report issued by the Association of American Medical Colleges (AAMC) in 1984. A number of medical schools substantially revised their curricula in response to the GPEP Report. One of the most important areas of change was in the way students were introduced to professional skills and perspectives they would need to practice clinical medicine. In order to accomplish this goal, a number of schools developed interdisciplinary courses that may have differed in scheduling, format, and focus, but shared a commitment to broadening skills and perspectives through experiential learning and small-group work. Most of these courses spanned the entire first two years of the curriculum, and some extended into the third and fourth years, blurring the line between the preclinical and clinical years. Among the most comprehensive programs were those at Northwestern University, Oregon Health Sciences University, the University of California, Los Angeles, and the University of Nebraska.⁸

Two of the more recent initiatives that have been more extensively reported or evaluated include:

1. the Medical School Objectives Project (MSOP), once again launched by AAMC in 1996, to assist schools in efforts to revise educational programs and produce physicians who can meet the changing needs of society and the health care environment.⁷ and
2. the Interdisciplinary Generalist Curriculum (IGC), a competitive, national seven-year demonstration project funded by the Health Resources and Services Administration (HRSA) to determine whether specific interdisciplinary innovations in preclinical medical school curricula could have an im-

pact on students' selection of careers in family medicine, general pediatrics, or general internal medicine.⁹

Of the various alternatives proposed, interdisciplinary training is the one posited as a logical and collegial solution to the problem of a cost-ineffective, over-specialized, fragmented and dehumanized health care delivery system.^{10,11} Lack of interdisciplinary practice among health care professionals is seen as the result of a lack of adequate sensitization and training of students while still in the early stages of professional education.¹² This has been articulated clearly by some authors, "Patient needs are interdisciplinary, and improving health care is an interdisciplinary effort. Working as part of an interdisciplinary team to provide and improve health care is a skill; like other skills it is best learned during training, not after."¹³

Various efforts, committees, curricular reform policies made at different levels (universities, academic medical centers, agencies, or foundations)^{3,4} to address the lack of interdisciplinary training and reform curricula in health science schools have largely been unsuccessful in producing fundamental changes in the training of medical students.¹⁴ Moreover, efforts still remain loosely defined and are unclear from the perspective of implementation of a concrete nation-wide program. A systematic review conducted by two authors in the United Kingdom of Medline abstracts published between 1985 and 1998 on the topic of multi-professional learning in the health sciences found a lack of conceptual clarity. The authors found that despite an agreed positive perspective on the value of multiprofessional learning, which in the commonsense view meant that health professionals worked together in teams and understood each other's professional values and roles better, there was a lack of agreement in the published literature about what the approach encompassed. Terms such as multiprofessional, multidisciplinary, and interprofessional were used interchangeably. The authors concluded that multiprofessional learning seems to be a fashion that people describe rather than question and stated, "The lack of critical analysis and questioning is remarkable. How can the concept of multiprofessional learning become robust if we don't know what it means, cannot agree to its goals, and do not seem able to report the weaknesses and problems encountered and lessons learned?"¹⁵

It is imperative that such efforts be afforded time to demonstrate their effectiveness and impact, however, the system of education itself has been presented as both the solution and the problem. The very

nature of the current educational system in universities, with rigid specializations, departmental isolationism, emphasis on parallel care, and competition between the research and service missions, has been identified as an important barrier to integrative learning and collaborative practice.¹⁶

The classification of educational reform efforts into the categories of *Vitamins* and *Vaccines* will provide a stronger conceptual underpinning to the educational reform process, help medical educators examine recommended measures in a critical light, and take steps to remedy deficiencies in the methods or understanding of the issue.

Vitamins

In the health sciences, the use of vitamins as intervention is a supplemental strategy. If the lack of relevant educational experiences are analogous to nutritional deficiency in a patient, then a comprehensive management goal would be appropriate diet modifications in order to remedy the lack of a particular nutrient. After all, vitamins are essential nutrients, and should be part of a healthy diet. An effective and efficient malnutrition intervention would address fundamental causes of the problem such that the patient does not require artificial vitamin supplementation anymore. Asking a patient to swallow vitamin pills every other day is only a temporary, stop-gap measure.

In the context of reform of the educational system, the *Vitamins* approach manifests itself by the addition or supplementation of new courses in the curricula. The courses selected for inclusion could span across disciplines depending on the particular deficiency that is spotlighted at that moment. For instance in the current climate of managed practice, courses such as Outcomes Assessment, Health Care Financing, Health Administration, that are part of the curricula of public health schools are being included in medical training only because they are perceived as enabling residents, medical students, and doctors to become efficient workers in the managed care industry.

The logic of curricular reform using the vitamins approach is that the supplementation of a variety of courses in a variety of disciplines will automatically lead to the kind of learning required to meet the demands of practice, and will be automatically reflected in the practice of future physicians. However, it is important to note the difference between interdisciplinary and multidisciplinary activity. Interdisciplinary activity is the process of knowledge production

that integrates over more than one discipline with integration identified as the defining element. Thus, interdisciplinary objects bridge two or more disciplines and result in a new single, intellectually coherent entity that is more than the linear sum of its parts. Multidisciplinary activity is that which assembles knowledge from more than one discipline in an additive fashion. Although multidisciplinary objects combine inputs from more than one discipline, the disciplinary elements retain their disciplinary identity.¹⁷

The *Vitamins* approach is a reactive one, and is similar to what has been termed an “add and/or substitute” strategy to education.¹⁸ This is compatible with traditional subject areas and has permitted incremental change without altering the fundamental structure of medical education, but true interdisciplinary fields are proving more difficult to integrate into existing curricula with this strategy. An example would be the debate about incorporating women’s health studies, an interdisciplinary field, into medical school curriculum. Women’s studies had no disciplinary home in traditional academic disciplines, and marginal and disparate faculty, many of whom were part-time or held joint appointments were charged with teaching this new field of study. Not only was time a limitation, even budgets were small, and highly motivated volunteer faculty attended committee meetings and developed curricula.

Would making women’s studies a specialized field and adding it as an elective to existing medical curricula solve this problem? Proponents maintained that the only way students would learn about women’s health comprehensively was to have a dedicated core group of faculty teach a well-defined curriculum with set parameters. However, opponents argued that making it a separate discipline would isolate the field, and ensure that only self-selected students opted for a rotation in this elective. Although the debate has not been resolved, it was found that the very nature of academia requires that a new program have a distinct, differentiated location, and generate specialized knowledge, enabling it to acquire resources, validity, and status.¹⁸ Thus, existing values of academic medical centers may in themselves be barriers to integrative learning, and facilitate the use of the vitamins approach.

In responding to the current situation of managed care in the health care system, which in itself is a response to high costs of medical care, a *Vitamins* type educational approach does not confront the values of this new arrangement as a threat to the core values of medicine;¹⁹ instead changes its curriculum

to fit its doctors into the mould of management-driven medicine rather than patient-oriented health care. As a medical historian has commented, "For the first time in over a century, medical education has veered away from a tight focus on the needs of learners; it is difficult to imagine how this can be good for the education of our country's future physicians."²⁰

Today, more medical students are taking courses in public health, especially health services research and outcomes-assessment, in order to become better managers of medical care; for good practice has been essentially linked with good cost-containment capability. There is nothing inherently wrong with cost-containment. In fact, practitioners should think of the most efficient methods for achieving health goals for their patients, but there is something perverse when the reason for its application is the profit of a corporation rather than the benefit of a patient. As one medical educator wrote, "I think the student who learns medicine in an environment where the bottom line is a cash flow will become a different kind of a person than someone educated in an atmosphere where, whether we do it or not, we at least hold out that the bottom line is the satisfaction of the patient's needs."²¹

Thus, in a *Vitamins* approach, short-term modifications are made in the educational curricula to meet those known and unknown demands of a hostile and very short-term future. Student burden is unnecessarily increased without necessarily enhancing their learning potential by adding new courses, training programs, and making frequent changes to the curriculum. Education, in this scenario is transmogrified to *Instruction* because it merely provides tools to negotiate short-term shocks and setbacks of an amorphous future. The institution of medicine is not in control of its own destiny, let alone those of its patients. The coping reactions change quickly with economic or other external crises, forcing the consumption of a new batch of vitamins every fiscal year.

Vaccines

Vaccines, on the other hand, are preventive measures that build host resistance against all future attacks by particular pathogens by targeting the immune system. The *Vaccines* approach, as defined in this commentary, is not a specific vaccine, but the premise or philosophy underlying vaccines. The concept of this type of health intervention implies that all real and potential threats to the host are foreseen. There is awareness of the functioning of the host's immune system, with continuous scanning of the environment to identify specific threats. Ultimately,

the immune capacity of the host is targeted for change making the host resistant to a variety of threats. Although the vaccinated person may be exposed to a virulent agent, he or she will cope with it successfully, reducing morbidity and mortality. Vaccines are a more comprehensive, primary preventive, long-term strategy for attaining health.

Thus, vaccines are proactive interventions that critically examine all components of a given situation: the environment, host, and pathogenic agent(s). By identifying fundamental factors responsible for health and illness, they generate solutions that not only tide over a current crisis but also increase the capability of coping with future ones. The same notion would apply to curricular reform that follows a vaccines approach.

The closest example that can be provided of this type of reform is the Interdisciplinary Generalist Curriculum (IGC) Project mentioned earlier. This innovation, originally conceived by the Primary Care Organizations Consortium (PCOC), was designed to examine whether a comprehensive school-wide change in curriculum of the first two years of basic science training would subsequently result in larger numbers of the school's graduates opting for a generalist field of practice. Ten demonstration medical schools, funded in two cycles between 1994 and 1997, and 1995 through 1998, implemented the program under the supervision of an interdisciplinary executive committee within the school, which obtained inputs from an interdisciplinary national advisory committee.⁹ The IGC project was implemented successfully, but was unable to answer the question of whether a fundamental reform at the preclinical level with students being introduced to clinical skills, and history-taking earlier with longer longitudinal exposure to a clinical preceptor would increase their enrolment into generalist fields of practice. The evaluators considered managed care a major confounding influence.^{9, 22}

However, the lack of desired outcomes did not render the IGC Project a failure. Attention to process evaluation demonstrated that it was able to make interdisciplinary collaboration in medical education work; recognize and confront pitfalls threatening it; develop community physicians as faculty; integrate an innovative generalist curriculum into the larger existing curriculum of a medical school; and confronts the potential for overburdening an already crowded curriculum.^{9, 22}

However, this fundamental or critical approach to resolving a crisis is not very popular among the

proponents of incremental short-term changes. For within a fundamental approach to a problem is embedded the questioning of existing power structures.²³ What takes place in the vaccines approach is a reappraisal of the problem from an institutional analysis perspective rather than cursory listing of cost cutting measures or the blaming of one set of individual actors over another. This kind of analysis of the problem when translated into policy or program calls for more comprehensive measures compared with the common practice of incrementalism in policy-making with changes occurring only at the margins.

If one takes a short-sighted costing or accounting approach to the problems in health care, it is easy to blame physicians for the current crises in health care. For were they not responsible for running amuck with high bills and technology-intensive care, and not thinking about the balance sheet? If one examines the complete set of circumstances using a critical perspective, it leads to the question: what made physicians end up as the accused instead of the advocates of a reformed health care movement? This analysis, rather than blaming this set of actors, would recognize that physicians were carried away by the contingencies of their situation. They were not reflexive philosophers who understood their role and limitations of their society and era; rather, they were pragmatic practitioners who acted within the accepted parameters and norms of society. The undue reliance of physicians on technology (which partly drove up costs) and specialization is not solely because physicians were being greedy, but because physicians were acting just like all other humans in their social group. They were being products of their times, part of the same technology and specialization-driven society that emphasizes quick fixes to medical and social problems, where cures are definitely more lucrative than prevention.

Prevention is no worse or better than cure, just as vitamins and vaccines both have their uses. Prevention and cure are strategies to be used in the service of human populations to improve the quantity and quality of human life. However, as Geoffrey Rose²⁴ wrote in *The Strategy of Preventive Medicine*, "It is better to be healthy than ill or dead. That is the beginning and the end of the only real argument for prevention. It is sufficient." Therefore, it is our choice as members of academia and professional bodies that determine how our society chooses to respond to a crisis¹⁹ — prevent it or try to fix it.

Prevention, within the critical vaccines approach, would have two components: the first one dealing with prevention of diseases in human populations

using medical and other relevant knowledge and technology; and the second, learning how to prevent the occurrence of future crisis in the field of health care. Here, health professionals will not be taught merely the best medical or management technology to negotiate the short-term crisis, but actually learn to deal with the human context in which health, illness and medical care variables interplay with each other and with other social factors to cause disease. They will be made aware of the limits of technology in the service of human health and sickness, and the strength of human interaction in the alleviation of human suffering that results from sickness.

Conclusion

Although, this may be the second revolution in health care and education²⁵ within 100 years in this country, the solution is strangely similar to the one 75 years ago when Yale introduced the first radical medical curricular reform — the "liberal arts physician" — trained in science, the values of medicine, and particularly for uncertainty and with the capacity to adapt.²⁶ In an article about the writing of his book *Time to Heal: American Medical Education from the Turn of the Century to the Era of Managed Care*,²⁵ medical historian, Kenneth Ludmerer writes, "History teaches the contingency of events. Past events were not inevitable, and neither will future ones be. Physicians and medical educators should find this message encouraging. We have the opportunity to help shape a new order, just as we previously helped create the existing one. We will be successful only to the degree to which we are willing to place the interests of the public before our own. Our dilemmas are as much internal as external, and we must be willing to make sacrifices to preserve the core values of the profession."²⁷

In contrast to the *Vitamins* approach of training medical students, which is an incremental approach to tackle crises in health care, and goes no farther than the next fiscal year in solving the intractable and eternal problem of providing humans with good health, the critical gaze of the *Vaccines* approach automatically leads to an approach that tackles problems of health care systems from a deeper layer and necessitates fundamental curriculum reform and attention to process. Short-term thinking, as embodied by a vitamins approach to education, may be beneficial to politicians who work in 4-year spans or with externally imposed term limits, or corporation executives who are concerned mainly with next year's balance sheet. However, physicians have been entrusted the task of keeping individuals and families, sometimes two or more generations, healthy over their

entire lifetime. This is definitely a long-term endeavor, and one that places great responsibility on the shoulders of those entrusted with the education of future doctors. A short-term approach such as the *Vitamins* approach is definitely not sufficient. The *Vaccines* approach, where the immune system of the medical education process is targeted for change, is equipped to deal with long-term issues, however it calls for a paradigmatic shift in our thinking about the education of future physicians.

Education in its truest sense is a wide-ranging vaccine against all the physical and psychological troubles of daily life. Can medical and health sciences education that enables practitioners to deliver health care for troubled people in the midst of social, cultural and economic turmoil of our contemporary existence be anything else but a vaccine?

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