

Pan American Health Organization

PAHO/ACMR 9/P/5.2

NINTH MEETING OF THE
ADVISORY COMMITTEE ON MEDICAL RESEARCH

Washington, D.C. 15-19 June 1970

PANEL ON MEDICAL EDUCATION

NEW MODELS IN THE TRAINING OF HEALTH PERSONNEL
THE UNIVERSITY OF SHERBROOKE

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By some act of God, I have been, during the past fifteen years, more often than desired, brought into contact with many academic, social and economic problems of the medical profession. Having organized the school of hospital administration of the University of Montreal, I was thrown into the furnace of medico-hospital problems: medical staff organization, accreditation of hospitals for internships and residencies, organization of general practice departments in hospitals, admittance of general practitioners in hospitals, etc., I had the privilege of participating actively in the drafting of a new set of standards for the accreditation of hospitals for postgraduate training for the College of Physicians and Surgeons of the Province of Quebec. Then, I spent three years at the College of Physicians and Surgeons of the Province of Quebec where the social and economic problems of the medical profession were my daily diet.

When I was offered the deanship at Sherbrooke, I felt that this was an excellent opportunity to contribute to the solution, at least partial, of medicine's problems by educating doctors more attuned to the actual social conditions and dedicated to a long life of learning. It was my chance that the authorities of my university accepted this challenge.

In my estimation, the most urgent problems were the following:-

1. Impact of the biological explosion on medical education.
2. Lack of integration of the basic and clinical sciences.
3. Social and economic relevance of medical education.

We proposed, then, to face the aforementioned problems in the following manner:-

1. EXPLOSION OF KNOWLEDGE:

The day of the big discoveries in organ physiology have drawn to a close, some years ago. More and more discoveries stem from highly sophisticated studies of cells, nuclei, cellular membranes, etc., We, at Sherbrooke, therefore, rapidly came to the conclusion that our students should receive a much sounder grounding in cellular and molecular biology if they were to grasp the implications of the new developments and maintain a life long interest in biology. We decided that the curriculum of the first year should consist largely of discussions and laboratory work in cellular biology.

2. LACK OF INTEGRATION OF BASIC AND CLINICAL SCIENCES:

We chose three methods of solving this problem:-

The first was a restructuring of the basic and clinical departments. We planned to start with a section of neurological sciences which would include all the basic and clinical specialties related to neurology (neuroanatomy, neurophysiology, neurology, neurosurgery, neurochemistry, neuro-radiology and neuro-pathology) a section of cardiovascular sciences to be followed by the digestive system. But that was too simple and much too innovative to be accepted! To obtain better coordination between the disciplines, we lumped all the basic sciences into a division of basic sciences and likewise for the clinical sciences.

The second method was to use clinicians in the teaching of basic sciences. I always felt that it was a loss of time to use a PhD to introduce a subject and that those clinicians well trained in basic sciences could be used to good advantage at this level. For instance, a cardiologist could give an excellent introduction in both the anatomy and physiology of the cardiovascular system and likewise many other clinicians. Thus, the dichotomy so long perpetuated between basic and clinical sciences would be replaced by complete inter-penetration. Basic scientists would give the more advanced courses to our medical students and to the MSc, and PhD candidates, would organize and participate in discussions with clinicians and residents. They would then have more time to devote to their research and to stimulate and participate in research in the related clinical fields.

The third method of integration consisted in the use of multidisciplinary laboratories for our students.

3. SOCIAL AND ECONOMIC RELEVANCE OF MEDICAL EDUCATION:

To establish a link between medicine and the community and to focus the attention of students and faculty on Man, we established a division of social medicine with sections of epidemiology, community medicine and behavioral science.

We planned to operate a community model in general practice outside of Sherbrooke where such a service is required, so as to evaluate scientifically the components of general practice: ie, the exact role of a nurse, a physician, a laboratory technician, a medical social worker, a dietitian and an hygienist, and the cost of these services. This community model would be used for teaching also at both the undergraduate and graduate levels and would, in point of fact, be the laboratory of our section of community medicine.

The division of social medicine would also undertake studies in medical economics and act as a leader in the regional planning of health facilities. We expected that the Ministry of Health of the Province would establish a regional health unit in our Center to better coordinate all regional health activities and participate actively in our teaching and research programs.

Lastly, this division of social medicine would have the responsibility of educating society in the domain of accident and disease prevention, of sanitation, dieting, air and water pollution, etc.,

During the first two academic years, this division would carry a heavy teaching load. We felt that these first years, steeped in biology, ought to be tempered with social sciences. A physician should have some knowledge about the various factors which tend to emasculate our civilization, be cognizant of the strengths and weaknesses of our modern society and of the medical profession, understand syndicalism and its "raison d'être" and have some knowledge of health economics. We hoped to complete our scientific teaching with seminars on literature, painting, music, politics and religion directed by outstanding artists, writers, politicians and theologians, so that our students would view their role within the vast array of society's servants which are all as essential and as important to our welfare as the physicians themselves. These cultural activities would "prevent the physician of the future from knowing more and more about medicine and less and less about man, from becoming more learned in his specialty and less a person of culture and refinement." (1)

BETTER METHODS OF LEARNING:

Yet, there was another problem, purely academic, that had to be tackled, namely the problem of learning. To make sure that

this problem would be well studied, we added an office of education into our structure and sent one of our professors to Millar for grooming. This department would be responsible for the curriculum and for promoting better teaching methods. Not only would it make sure that our curriculum would be neither too specialized, nor too loaded, but would also ensure that "rapport" be maintained with psychology, sociology and economics. It would also sharpen our methods of evaluating the students.

Under this caption, I must add that we abandoned the teaching of anatomy by the dissection of cadavers. We felt that it was a loss of time, though "a glamorous one". This perpetuation of medical folklore required too much effort and was replaced by the use of dissected models, artificial organs and the attendance at post-mortems.

To recapitulate, we structured our school differently, but not to the extent desired and expected. We accentuated the teaching of cellular biology. We planned

to have clinicians participate fully in the teaching of basic sciences. We decided to pay more attention to what goes on in the world through our department of social medicine and provide our students with a broader and more social outlook. Finally, we paid heed to the progress made in the sciences of education.

RECRUITMENT:-

It was my firm conviction that, given a good cause, it could be sold to almost anyone. I must therefore state immediately that I felt that recruitment would not be a major problem. Our experience vindicated this conviction.

One word of caution though: one must always pay attention to all the information obtained on each prospective candidate. Better still, all letters of recommendation should be followed by a telephone call, as some are reluctant to put on paper what they would confide in a conversation.

NOW, WHERE DO WE STAND IN 1970?

STUDENT BODY:

We admit our maximum of 64 students who are chosen from well over 600 applicants. In addition, 35 candidates are working towards an MSc or a PhD.

PROFESSORIAL STAFF:

Administration:	6
Basic sciences:	36
Clinical sciences:	81
Social medicine:	18

for a total of 141 professors.

INTEGRATION OF BASIC AND CLINICAL SCIENCES:

We are moving towards further integration, though at a slower pace than envisaged. During the last year, the professorships of bio-chemistry and physiology became vacant. No replacement were made and none are being considered. In bio-chemistry, we now have three research groups which may well set the structural pattern: one in cellular biology consisting of a pathologist, a virologist and a bio-chemist; one in the chemistry of proteins and one in molecular biology. In physiology, two research groups are already in operation.

In the clinical area, multidisciplinary groups are already involved in gastro-intestinal, cardiovascular and clinical pharmacology research. Here, the appurtenance to departments is kept, while it was abandoned in biochemistry. Similar research groups shall be operative shortly in other fields.

The integration, one senses immediately, was not as total as planned at the beginning, but is progressing slowly but surely. Everyone was in favour of new structures during the pre-appointment period. The enthusiasm congealed rapidly thereafter, especially when one's department was to be abolished or whose members would be dispersed amongst research groups or new clinical sections such as neuro-sciences or cardiovascular sciences. The main reasons for the partial success, in this area, are multiple. Amongst the most important are the strong conservatism of the profession which, amusingly enough, penetrated rapidly the non-medical staff as well and the fear of loss of prestige and power which are so well protected by the classic departmental structure. The balkanization of our colleges with its jealously guarded territorial autonomy well explains the fixity of our curricula from 1910 to 1950 and the tremendous difficulties encountered by those who dared promote new ideas.

There are some who feel that the three divisions have compartmentalized the faculty and have not created the unity which was eagerly sought. They feel that more integration would

obtain if the departments came under the supervision of associate deans for undergraduate education, research and post graduate education. There is a feeling that there would be less cleavage and less tendency for a division to unite with another and "gang-up" on the other. I believe that the criticism is only partially justified. It is easier to deal with three divisional chairmen than several heads of department. Moreover, the former act as excellent catalysts.

MULTIDISCIPLINARY LABORATORIES:

I do not believe that these labs are being used to their fullest and rightly so. During many half-days, the students are off to seminars on psychiatry, social medicine, etc., or they are working in the community or in the library. Consequently, I feel that these labs could be used by a second group of medical students or even by dental students during their first year. In such instance, the so-called "home-base" of the student, if needed, could be adjacent to the library.

TUTORING:

Each student had a tutor during our first two years, but tutoring soon fell into disfavour. Today, tutors are assigned only to students who have difficulties, especially "the repeaters". The faculty will re-evaluate this method during the coming year.

DIVISION OF SOCIAL MEDICINE:

For local reasons, this division has concentrated its main efforts on the planning of the regional health services, mostly institutional, to which it is heavily committed. It has carried

a heavy teaching load. The community model of general practice should be functional within a short time.

We have organized a family practice unit in our O.P.D. to act as an educational and research nucleus. To date, 170 families have registered for their primary health care. Two similar units will be created in our immediate area.

It is too early to evaluate the work of this division insofar as it might have affected the behavioral pattern of our students. One might softly suggest that it has affected the thinking of our professorial staff in that they are more receptive to ideas and projects of community health care and of better methods of delivery of services. They seem to view the care of the sick and problems of health in a more social perspective.

CURRICULUM:

First year:-

It is made up of three periods:-

- | | |
|--|----------|
| 1st: cellular and tissular biology: | 12 weeks |
| 2nd: cellular and tissular aggressions: | 12 weeks |
| 3rd: hematology and clinical introduction: | 12 weeks |

Concurrently, a total of 135 hours of social medicine are given, mostly in seminars, and 18 hours of modern concepts of psychology as applied to medicine. The cellular and tissular biology is taught by pathologists, embryologists, genetists, histologists, biochemists, microbiologists and biophysicists.

Second year:

It is constituted by 5 periods:-

1st: neuro-locomotor system:	111 hours
2nd: endocrinology and reproduction:	93 hours
3rd: cardiovascular:	67 hours
4th: respiratory:	56 hours
5th: urinary and digestive systems:	94 hours

Here again, the division of social medicine contributes 118 hours mainly in seminars and research projects. A total of 64 hours is devoted to psychiatry.

Third year:

It consists of rotations through medicine, surgery, obstetrics and gynecology, pediatrics and psychiatry. It includes an elective of 6 weeks which may be spent in any of the three divisions and also one day throughout the year devoted to an elective.

Fourth year:

It is what is now accepted as our rotating internship with the following periods:-

- | | |
|--------------------------|-----------|
| 1. medicine: | 10 weeks |
| 2. surgery: | 10 weeks |
| 3. obst. and gynecology: | 6 weeks |
| 4. pediatrics: | 8 weeks |
| 5. psychiatry: | 8 weeks |
| 6. elective: | 10 weeks. |

EVALUATION:

First year:

- a) 75% is allotted to a written, multiple choice final examination.
- b) the other 25% is allotted in the following manner:-
 1. 15% personal evaluation by the professors of social medicine, based on seminar participation and written projects.
 2. 5% personal evaluation by the professors of psychiatry, based on seminar participation.
 3. 5% based on a minimum of two case histories submitted at the end of the year.

Second year:

Same as above, except that the case histories include a physical examination.

Third year:

1. 30% to a final multiple choice examination with a problem-solving accent.
2. 30% to a final clinical examination before a jury of two, one of which is always an internist.
3. 20% personal evaluation at the end of each period (5) by the members of the department concerned.
4. 10% personal evaluation after the six weeks elective.
5. 10% personal evaluation on the work done during the weekly elective project.

Fourth year:

1. 30% to a clinical examination held before two juries at the end of each rotation.
(Each jury is made up of two professors)
2. 70% personal evaluation by all the professors involved in each rotation.

During the first two years, optional exam sessions are held. These are followed by a thorough discussion of the questions asked and the answers given. It is used by the faculty to evaluate the teaching and by the students to assess their own progress.

BUDGET:

Here is a summary of our operational and research budgets since our birth:-

<u>Year</u>	<u>Operational</u>	<u>Research</u>	<u>No. of stud. under-grad.</u>	<u>No. of stud. graduate</u>
1964-65	37,757.25			
1965-66	239,737.59			
1966-67	536,618.17	79,360.00	32	3
1967-68	923,334.87	249,826.00	48	5
1968-69	1,810,116.00	783,709.00	48	18

WHAT ABOUT THE FUTURE?

During our first years of organizational labor, our thoughts and efforts were directed towards the social and the scientific aspects of medical education. Absorbed by the ideal of supplying society with a global physician or a physician "in toto", we overlooked the economic aspects. We wanted the best, even though our production was rather low. We used all and any argument to justify space and equipment. The figures quoted by Smythe (2) cannot but lead one to a reassessment of the justification of the enormous sums of money invested in medical education. Smythe quotes one instance where the investment in basic and clinical sciences facilities per student costs close to one million dollars. If the deans of the other professional schools were as adamant as we are, there would be few dollars left for primary and secondary education, road-building, pollution fighting, industrial promotion or welfare....

Faced with a manpower deficit in the health area, the government will ask that efforts be devoted primarily to training more personnel and that each medical school specialize in one or many fields, but not in all, because it is well nigh impossible (3) To duplicate departments in the same university is a serious social injustice, unless it be required by geographical reasons. Duplication for reasons of prestige is unacceptable. Why shouldn't schools of medicine in a given geographic region plan their growth and development together? asked Meads last year. (4)

Consequently, I believe that:-

1. The university departments of biology and related sciences will be called to provide the teaching in basic sciences preparatory to clinical applications, as suggested in the State of Illinois Report on Education in the Health Fields⁽⁵⁾ and as it is already done elsewhere.⁽¹³⁾ There is no doubt in my mind, as stated by Lee⁽¹⁴⁾ that "much of what has been taught in the first two years of medical school is or could be available in modern college (or even high school) biology and chemistry courses." Evidently, some of these departments could be located in the college of medicine, such as bio-chemistry (University of Montreal and University of Ottawa) but duplication must be avoided at all costs.

2. Society will refuse to support what has been called by dean Ebert of Harvard "the lopsided and jerry-built medical school structure"⁽⁶⁾ with its lack of concern for the general welfare of the school, the university and society. The latter will surely see that priority is given to projects that will translate new knowledge into the "Art of Medicine". Schools of medicine will therefore have to give more attention to clinical medicine. As Crook recently wrote: "...the fruits of research will not filter down to the people...unless top quality doctors are caring for patients on the front line of medical practice...."⁽⁷⁾

3. Research and graduate education will become a full-time endeavour. Basic scientists will neither have the freedom nor the time to participate in undergraduate teaching. After having

allotted 60% of their time to research and 40% to holidays, vacations, scientific meetings, planning, administration and graduate education, there is no time left for undergraduate teaching, committee work and evaluation of students. Moreover, the scientists' fields narrow rapidly as they extend in depth, quite a limiting factor in undergraduate teaching. When one adds the high costs of equipment, we come to the conclusion that research is a fulltime job, that it should be performed in a research institute wherein the use of costly equipment is communal and the administrative procedure simplified and exempt of all red tape. This institute should encompass animal and human biology, as they cannot, and ought not, be separated.

There is a growing feeling that some clinicians will have to choose between research and practice. In many cases, we have either good research and poor medicine or good medicine and poor research....Society will not accept the former and will refuse to subsidize the latter. Very few have the "distinct gifts" that are essential in both research and service, as Cardinal Newman wrote many years ago. ⁽¹⁵⁾...."The time is not too distant when more emphasis is placed upon the faculty as teachers of medical students rather than successful seekers of research grants"⁽⁸⁾... "It is high time that we realize that research is a fulltime endeavour"⁽¹⁶⁾ and that "attempts to justify university research by arguments based on the improvement of teaching are of doubtful validity."⁽¹⁷⁾

The multiple allusions to the absenteeism of fulltime clinicians have become less facetious since the problem has been compounded by their surprising willingness to refer everything to a committee and their insistence on committee membership. This last form of absenteeism is more vicious because it engenders procrastination. It may well be that some part-time clinicians will be recalled to compensate and ipso facto inject a community flavour to the teaching and practice of medicine. (19) One readily understands Bennett's statement that "it is increasingly difficult to explain...why the medical schools don't do what....they could if they wanted to." (18)

4. Medical schools will have to produce better programs and better evaluation methods than those utilized in the past. They will have to employ better methods of choosing their students and once and for all pay more than lip service to the acceptance of the broadly-trained, socially-dedicated young men and women. Motivation and general educational background will receive higher marks in the admitting procedure than the ability to pass exams and the traditional scientific preparation.

5. The calendar year will be generalized and the educational processes accelerated to make better use of the gigantic investment in our health centers.

6. The medical school's influence will be extended to all the hospitals of a given region so that clinical training be broader and more community oriented and continuing education be available to all physicians. (14)

CONCLUSION:

Our activities, like that of all heavily subsidized social institutions must be more relevant:-

- a) relevant to the needs of society for better medical care to all citizens.
- b) relevant to the total needs of the sick or as Evans has stated:...."rediscover the patient in his equally complex diagnostic and treatment setting as the reason for medicine and without whom the student cannot learn." (9)
- c) relevant to the economics of the State or of the Nation by maximum utilization of the actual scientific and clinical resources already available, such as the basic science university departments and the existing hospital facilities of the area. (13)
- d) relevant to the needs of physicians by providing for continuing education and especially for better post-graduate education. In the latter, a complete overhaul

is long overdue and sad to say, it is still characterized by its traditional methods and a total lack of academic "savvy". Millis called it "an outmoded apprenticeship." (10)

- e) relevant, finally, to the needs and aspirations of our students by offering rational courses with opportunities for individual maturation and development, with fairer methods of evaluation and above all, with a faculty whose main concern is the education of socially oriented physicians, or again, as written by Evans:....."to rediscover the student in the scientific and clinical organizational structure of the medical school and its appurtenances as the reason for medicine and health profession education." (11)

We must focus the attention of the student on man rather than on the disease, on man in multiple social settings, on man's capabilities and adaptability, on man's shortcomings and failures. Then, and then only, will the physician tend naturally towards the patient's welfare....

"If we could be assured, stated Evans (12) of a generation of practitioners with such understanding of the nature of man and of professional responsibility, many of the current questions concerning specialization, the use of technical aids, the organization and financing of health services, the threats of over-emphasis of research in one field as

compared with another and the respective roles of the practising professions in patient care and the universities in education, would disappear."

Such was our hope and such should be our goal in the future.

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June 1970.

Encl: app. 1 and 11
lists of references

APPENDIX 1

The program leading to an M.D. degree could be as follows, in my Province, at least:-

Primary school	6 years (one additional year if required)
Secondary school	5 years (one additional year if required)
Pre-university (Community college)	2 years (one additional year if required)
University: faculty of arts and sciences	1 year
University: medical school	2 to 3 years
University (medical school) residency for gen. practice	2 to 3 years
University (medical school) residency for specialty	2 to 4 years

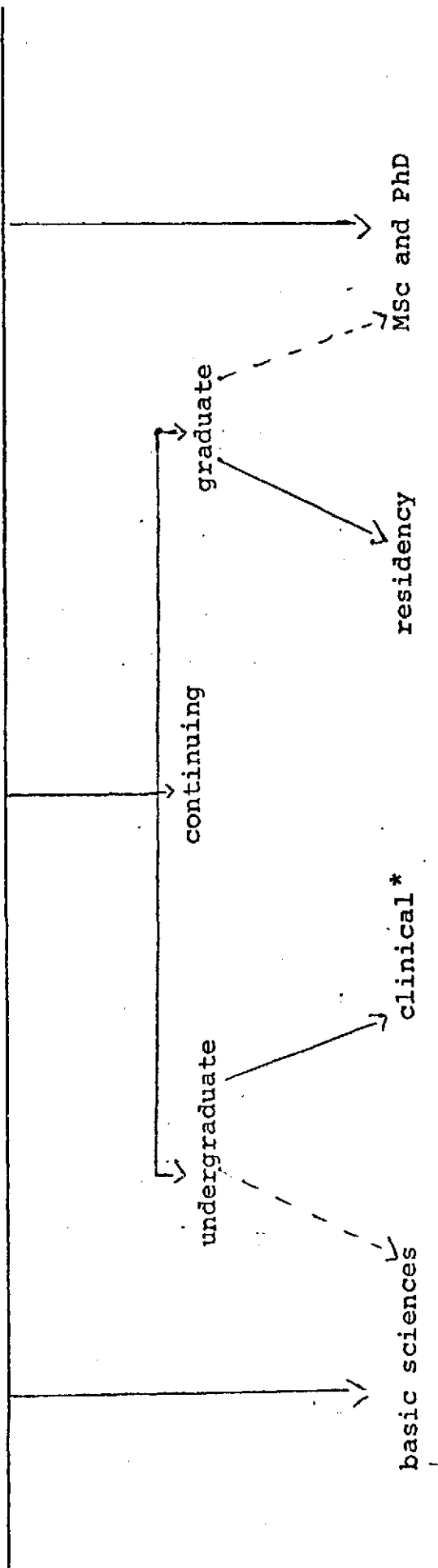
V.P. in charge of research and graduate studies



INSTITUTE OF BIOLOGY

COLLEGE OF MEDICINE

FACULTY OF SCIENCES



* New clinical structures will call for the participation of clinically oriented basic scientists in the practice and teaching of clinical medicine. For instance, the department of cardiovascular diseases will include a clinical pharmacologist and the department of neurological sciences will have a neuro-physiologist who could well be an electro-encephalographer.

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