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PANEL ON MEDICAL EDUCATION

MEDICAL STUDIES IN THE UNIVERSITY OF BRASÍLIA

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Brasilia, the new capital of Brazil, became a focal point of innovation influencing most of the local initiatives in the social, economical and political fields. University education, taking advantage of such creative climate, was organized according with a completely new scheme, in a comprehensive structure, and the School of Health Sciences, following this same line, was developed without any restraint from legal ruling and with a complete freedom for selecting its faculty throughout the country looking for highly qualified personnel not previously committed to traditional structures. This framework was the background for establishing the experimental project of medical education described in this paper.

Frame of reference

As basic guidelines for the model that we are going to analyze, it is necessary to point out the general principles on which the whole development of the plan was based.

The department, as it has been developed in the medical schools, is artificial; being a good example of the truth contained in this assumption the fact that in most departments in Latin American schools have become an aggregate of the previously existing "cátedras" (chairs), a sort of "super-cátedras", with very little integration among them. Even in the North American universities the departmental structure tends to be an artificial situation because the development of scientific research and the need to use new techniques breaks down the barriers of specialized fields, bringing entirely different departments side by side.

No structure will be strong enough to impede the development of research carried out in one sector of a general discipline simply because the methods employed belong to another sector. A physiologist who wants to study the intimate mechanisms of synaptic transmission or the effect of a particular hormone, will have to go to biochemists, histologists, biophysicists and physiologists, and often the process he is studying will be directly related to the pathological and the clinical fields.

It is well known that in many recent conquests of medical science there has been a tendency to suppress the classical separation between basic and clinical research, and according to this point of view, it is imperative that the organization of resources be made in such a way to permit the possibility of integrating the activities of various professionals in areas of common interest.

"The time has come too when the 'teacher of medicine must also ask critically whether the teutonically inspired professorial department so dear to Flexner really furnishes the best environment for medicine to flourish.' " 1/

In the organization of medical knowledge for teaching purposes, the break-down by subjects has been the accepted tradition. In some occasions such break-down is made on the basis of methodology (whether this is physiological, biophysical, histological, etc.) and, in some others, in terms of topography or organic function. Theoretically, the student should be able to group together, in a logical way, all the parts of these two subdivision, to properly understand the human being as a whole. Nevertheless, if one accepts the suppression of the first classical subdivision in view of the connection between the biomedical sciences already referred to, it would serve to demonstrate objectively the same principles of each subject now made up, in functional terms, of a cell, an organic system or an individual.

It should be remembered that from the moment his basic training starts until the physician is fully involved in his professional activities, a good ten years pass. If one considers the rate of development of medical science in that same period, it will certainly be evident that a great deal of superfluous teaching for the new doctor has been offered on aspects which even in that period of time have gone out of date, and in some cases have become quite obsolete. This implies purging the curriculum of details and trifles, and demands concentration on the scientific basis necessary to further development in a process of continuing self-education.

If one considers the practice of the medical profession itself as an activity of permanent apprenticeship, the usual concern of medical schools for a thorough transmittal of a theoretical body of knowledge would fall apart, and the presentation of many themes through integrated practical exercises and experimental projects will become possible allowing the student, by critical analysis of the results obtained, to acquire the mentality or adopt the attitude required by the scientific method. A learning process that is much more deductive than inductive will then be developed.

Taking into account the need for integrating the process of training doctors, and the student's own motivations, characterized notably by his interest of the human contact provided by handling patients and dealing with community problems one must keep in mind the need to encourage, along

1/ Miller, H. Fifty years after Flexner. Lancet 2:647-654, September 24, 1966, apud Parks, J. The University Medical Center, Journal Medical Education. 44: 1-11, January 1969.

with the presentation of the medical subjects, early consideration of the social and ecological aspects of the population of the area subject to the school's influence.

Such activity, which would have to continue throughout the entire course of study, must lead progressively to a kind of relationship similar to that which exists between doctor and patient or between patient and student in university hospitals, and which represents in the work of the community what has been called "clerkship" in the classical training in the hospital.

Clinical training can, in turn, be conducted through a system of comprehensive medical care, in which the available hospital organization should be adapted to conform with the needs of what are called "integrated health units", in which curative and preventive care are dispersed as a whole. The student would participate according to a pattern of increasing responsibility under the supervision of the teaching staff.

In relating the proposed model to traditional education which is the hospital environment where the patient is subjected to the care of a group of medical specialists, we may say that in the proposed model the participants are: the community, the health team, or the organization in charge of providing health services to the entire community, with the students and their instructors included in the same system of providing care.

An educational program of this type does not need to have as its purpose the demonstration of the maximum effectiveness of a particular setting, but rather the training of the future doctor to be as efficient as possible in face of the existing conditions.

Brasilia's solution

Brasilia's curriculum was drawn up on the basis of the above frame of reference, in accordance with the general structure of the university, made up of central institutes and multi-professional schools.

Entrance to the University is determined through a process of overall selections for all fields of knowledge. Those who wish to become doctors, once accepted, first enter the Central Institute of Biology, where they follow a one-year course which is the same for all students seeking to study biology, medicine, psychology or veterinary science, and, in the future, for those who select dentistry and nursing.

During this period, which has the characteristics of a premedical course, the students must pass subjects as biochemistry, biophysics, genetics, cytology and applied mathematics. Future medical students are also required to take courses in anthropology and social psychology.

The professional cycle of the medical course started in 1966 with the following stated purposes:

1. To train general practitioners who are capable of understanding the multiple factors which change the individual-environmental balance and produce disease; who envisage health in its broadest sense as a state of complete physical, mental and social well-being, and who are thus qualified to promote, maintain, and restore the health of the individual, family and community.

2. To provide students with the necessary general medical background for taking postgraduate courses (advanced or specialization courses) or academic training (Master's degree).

3. To provide an education, in which by integrating teaching and learning and achieving a proper balance between expositive and experimental training, students are furnished with the intellectual tools and opportunities for creative activity necessary for the development of the scientific mind.

4. To develop new values and attitudes to medicine, through integrated health programs, emphasizing: health and not only diseases; community and not only hospital activities; group and not only individual work; multidisciplinary and not only the medical approach to health problems.

5. To provide an educational experience, which, being agreeable and productive, develops in the student a continuing interest in the study of medicine, thus assuring that he adapts his knowledge to the evolution of science and technology.

Educational Policy

To attain the objectives set by the School of Health Sciences for its medical course, an educational policy has been established aimed at the coordinated, harmonious, and integrated participation of its faculty members in multidisciplinary teaching teams, so that a general interest in teaching medical science, and in developing in the student the attitudes the future physician needs to have, take precedence over a private interest in a discipline or speciality.

The purpose of the participation of all the faculty members in the integrated programs is also to ensure the balanced development of the basic activities of the School of Health Sciences: namely, education, research and medical care.

Four basic conditions were therefore established for the medical course:

1. Mastering of the basic sciences in the general courses organized in the basic institutes of the University of Brasilia.

2. Integrated pre-clinical education providing the student with knowledge of the processes of attack on cells, tissues, and organisms; of the mechanism of reaction and defense; of the normal and pathological functioning of various systems of the body.

3. Training in an integrated health unit, so the student can master the various activities designed to promote and protect health, prevent and treat diseases, in the individual, the family, and the community.

4. In-service training in a hospital operated by the Faculty, or accredited by it, designed to supplement the training of a general practitioner, or to prepare a student for postgraduate specialization courses.

Objectives of the medical course for students

At the end of the medical course of the School of Health Sciences of the University of Brasilia, a student should be qualified to:

1. Treat an individual as a physical, mental and social unit.
2. Establish proper relation with a patient and members of his family, so as to understand their needs and conflicts as well as the adaptation of the patient to the environment in which he lives.
3. Diagnose the health condition or the disease of the individual, examined through an appraisal of his physical, nutritional, psychological, and social status.
4. Diagnose the most prevalent diseases in the region and in the country, and prescribe the proper treatment for them, bearing in mind the social and economic level of the individual, and to take preventive measures as indicated.
5. Follow the evolution of a morbid process and its treatment, and give information about it to the patient and his family, so that he not only treats the disease, but also protects the health of the family and the community.
6. Explain human reproduction, normal pregnancy and delivery.
7. Recognize and treat significant disorders of pregnancy, and to attend a normal delivery.
8. Describe the growth and development of an individual from birth to old-age and to recognize his disorders.
9. Act in medical and surgical emergencies and take initial measures for maintaining vital processes, and direct treatment of the patient until he is subsequently referred to a specialist or a better-equipped medical center.
10. Be familiar with the health policy of the region and of the country, as well as the code of medical ethics.
11. Work in a health team or as a member of a multidisciplinary community, development or public health team.

Description of facilities and programs

The Faculty of Medical Sciences has three units, which are:

The Experimental Medicine Unit
The Integrated Health Unit
The Specialized Hospital Unit

The Experimental Medicine Unit is located on the University campus and consists of 12 multidisciplinary laboratories and their respective inter-laboratories, corresponding to a locally projected physical plant which is more functional and more economical. The unit also has a dissection hall for anatomy, a lecture room and the supplementary installations having to do with the logistics of operating the multidisciplinary laboratories, including a storehouse for keeping and preserving the equipment used by the students, the biological devices they use, auxiliary laboratories for histological technology, scintillation counters, etc. Each multidisciplinary laboratory has capacity for 16 students distributed in groups of four, with installations for standing or seating work and even have facilities for holding seminars.

The basic educational unit is represented by a minimum of two of these laboratories with the respective "inter-lab", which means that the total capacity of the school is always limited to multiples of 32. In the case of Brasilia, 96 students per class are admitted. Each student has exclusive use of a particular area of the laboratory for two years, and it is therefore called the "Home Laboratory".

In this same unit there are additional facilities for research, grouped according to the multidisciplinary research programs and including a set of laboratories for each of the organic systems.

It is in these installations that the first cycle of instruction of the School of Medical Sciences takes place, which means, for a two-year period, almost all the formal teaching system, with a total of 2,200 hours of activities, 70% of which correspond to laboratory practice, 18% to lectures and 12% to seminars.

In this phase the instruction program is divided into blocks with a duration of 4 to 12 weeks each. In each of these the subjects are examined in relation to the biological being from both an individual and a community point of view, or what we call the individual phase and the collective phase.

The first block, which lasts for eight weeks, takes up the following subjects: Cell and Tissue Biology, Introduction to Anatomy, Growth and Development, and Demography.

Cell and tissue biology takes up the study of the structure and function of the cells, principally the morpho-functional relations and the organization of the cells in the tissues. It describes the functions of subcellular structures, their reciprocal action and the processes of metabolic regulation, to offer the student an understanding of the cell as a functional unit.

The general introduction to anatomy provides an overall morphological understanding of the individual through the study of surface anatomy, using the technique of simple "in vivo" inspection, followed by vivisection of dogs, which makes it possible to observe the various tissue caps and the abdominal and thoracic cavities with the organs "in situ". Radiological anatomy of the entire human body completes this analysis.

This group also takes up the subject of growth and development, including the physical and mental study of man at various ages, and demography for an analysis of community growth.

The next group refers to the mechanisms of aggression and defense, which makes up a 12-week course in which are studied the aggression phenomenon, the reaction phenomenon and the morbid process derived from these phenomena, through integrated experimental models which serve as illustration of the various processes of aggression by biological, physical and chemical agents. Each model is examined for about a week and analyzed from the point of view of morphology, microbiology, parasitology, immunology, pharmacology, epidemiology and environmental sanitation.

Included in these experiments are models of infection, tumoral neoformation, drug action, metabolic alteration, and so forth, bringing out the concepts, methods and mechanisms contained in the morbid process, the differences among the various types of aggression, the importance of the reaction and the interaction between the aggressor agent, the host and the environment in the pathogenic process.

The results of each experiment are discussed in seminars in which are analyzed the aggression-reaction phenomenon, parasitism, the importance of basic sanitation, epidemiology, and the therapeutic and prophylactic measures adopted.

This block represents a total of 440 hours of activities per student, 70% of which are devoted to laboratory work, 10% to seminars and 20% to lectures.

During the second semester of this first year of medicine begins the instruction for groups of students in blocks on the various organic systems, which continue for a year and a half, up to the end of the second year of medicine. In these blocks, the examination of each subject includes studies in anatomy, embryology, histology, physiology, pharmacology, etc., up to pathology and clinical symptomatology, including those aspects related to community medicine.

In this respect the curriculum differs from that previously proposed by Western Reserve University. The study of normal and pathological human biology is not separated into two cycles, but instead presents a

totally integrated analysis of normal and pathological phenomena. The course also includes experimental projects, based fundamentally on procedures of physiological studies through which are presented specific aspects of other sciences.

This system not only has practical application but is also simpler and perhaps more economical than the classical methods. An example of this can be seen in the procedures of physiological and pharmacological studies which, with identical structure, are repeated in subsequent years when in reality, in the proposed system, they can be presented in succession with the same experimental preparation.

In the course of this instruction selected cases are presented which serve as illustration of the pathological aspects and, although at this stage the students do not go to the hospital, the patients are brought to them for symptomatological demonstration.

The groups of subjects related to organic systems are arranged as shown in charts I, II and III.

To give more details of the structure of those blocks on the various organic systems the next charts present the contents of one of the blocks (endocrine system) and the distribution of the activities according to the teaching and learning methodology utilized.

As it can be seen not only all the specialized branches are involved but also it is intended to maintain a good balance between theoretical and practical work.

The Integrated Health Unit is the second unit of the school, which consists of a 200-bed hospital with extensive facilities for outpatients and a Health Center. This Unit is located in one of Brasilia's satellite cities located 12 1/2 miles from the School of Medicine. In this community of 30,000 inhabitants, the University, by virtue of an agreement with the health service in the capital, is in charge of providing all medical and health services. Moreover, two rural stations which are also used for student practice activities also depend on this unit.

This is the environment in which the second training cycle unfolds; this cycle lasts two years and in it the educative process takes on the characteristics of "in-service training", limiting theoretical instruction to what is given as it comes up in seminars, case discussions, and clinical, radiological and clinical-pathological sessions.

After a course of introduction to community medicine, which examines, through seminars and practical exercises, themes of epidemiology, demography, basic sanitation, biostatistics, vital and hospital statistics, applied

CHART I

F I R S T Y E A R

8 WEEKS	12 WEEKS	12 WEEKS	4 WEEKS
Cell and Molecular Biology Growth and Development	Cell and Tissue Injury Aggression and defense	Nervous System Mental Health Behavioral Sciences	Muscular-Skeletal System Rehabilitation
Laboratories 150 hours Lectures 55 " Seminars 10 "	Laboratories 300 hours Lectures 100 " Seminars 40 "	Laboratories 200 hours Lectures 140 " Seminars 25 "	Laboratories 60 hours Lectures 50 " Seminars 15 "

S E C O N D Y E A R

6 WEEKS	8 WEEKS	4 WEEKS	12 WEEKS	4 WEEKS
Endocrine System and Reproduction	Gastrointestinal System Metabolism and Nutrition	Hematopoietic System	Cardiovascular and Respiratory System	Urinary System
Laboratories 70 hours Lectures 35 " Seminars 37 "	Laboratories 215 hours Lectures 40 " Seminars 20 "	Laboratories 70 hours Lectures 15 " Seminars 10 "	Laboratories 300 hours Lectures 50 " Seminars 30 "	Laboratories 60 hours Lectures 20 " Seminars 15 "

CHART II

TEACHING - LEARNING ACTIVITY CHART

Number	Division	Specialty	Activity					Time
			Lect.	Demon.	Prac.	Research	Clin. Sem.	Eval.
1	EM	Introduction - Med.	■	★				1 h.
2	EM	Histology	■		●			2 h.
3	IM	Anatomy	■		●			3 h.
4	EM	Biochemistry	■		●	◆		5 h.
5	EM	Physiology	■					1 h.
6	IM	Pathology	■	★				2 h.
7	IM	Physiopathology	■				●	2.30 h.
8	EM	Physiology	■			◆		1 h.
9	EM	Biochemistry	■				●	5 h.
10	EM	Morfolgy	■					2 h.
11	EM	Basic Sciences	■				●	2 h.
12	EM	"	■				●	2.30 h.
13	EM	Biochemistry	■					1 h.
14	IM	Anatomy	■		●			3 h.
15	IM	Surgery	■		●			2.30 h.
16	EM	Biochemistry	■	★				1.30 h.
17	EM	Physiology	■			◆		6 h.
18	EM	Histology	■		●			2 h.
19	EM	Embriology	■	★				1.30 h.
20	EM	Physiology	■					1 h.
21	EM-IM	Med/Basic Sciences	■				●	2 h.
22	EM-IM	"	■				●	2.30 h.
23	IM	Medicine	■					1 h.
24	IM	"	■				●	3 h.
25	AM	Social Medicine	■				●	2.30 h.
26	EM	Physiology	■			◆		2.30 h.
27	IM	Pharmacology	■				●	2.30 h.
28	EM	Physiopathology	■				●	2.30 h.
29	IM	Embriology	■		●			2.30 h.
30	EM	Histology	■		●			2 h.
31	EM	Biochemistry	■	★				2 h.
32	EM	Physiology	■					1 h.
33	EM-IM	Med/Basic Sciences	■				●	2 h.

TEACHING - LEARNING ACTIVITY CHART

Number	Division	Specialty	Activity					Time
			Lect.	Demon.	Prac.	Research	Clin. Sem.	Eval.
34	EM-IM	Med/Basic Sciences	■	★				2.30 h.
35	IM	Medicine	■				●	1 h.
36	EM	Physiology	■		◆			4 h.
37	IM	Pathology	■		●			2 h.
38	IM-AM	Social Medicine	■				●	2.30 h.
39	IM	Obst/Gynecology	■		●			1 h.
40	IM	Physiology	■					2 h.
41	EM	Physiology of Reproduction	■			◆		3 h.
42	AM	Demography/Social Med.	■				●	2.30 h.
43	EM	Embriology	■	★				2 h.
44	EM	Biochemistry	■		●			2 h.
45	IM/EM/AM	General	■				●	2 h.
46	"	"	■				●	2.30 h.
47	IM	Anatomy	■		●			3 h.
48	IM	Pathology	■	★				2 h.
49	IM	Obstetrics	■			◆		1 h.
50	IM	"	■					8 h.
51	EM	Physiology	■	★				1 h.
52	EM	Histology	■				●	2 h.
53	IM	Obst/Gynecology	■				●	4 h.
54	IM/AM	Obst/Social Medicine	■	★			●	2.30 h.
55	IM	Obstetrics	■				●	2 h.
56	IM	Pharmacology	■				●	4 h.
57	IM	Obst/Gynecology	■				●	2 h.
58	IM	"	■				●	2.30 h.
59	EM	Physiology	■					1 h.
60	EM	Physiology	■					4 h.
61	IM	Medicine	■			◆		3 h.
62	IM	Pathology	■	★			●	3 h.
63	EM	Biochemistry	■					1 h.
64	IM/EM	Obst/Gynecology	■				●	4 h.
65	IM	General	■				●	2 h.
66	IM/AM/EM	"	■				●	2.30 h.

CHART III

Time in Hours	Lectures	Demonstrations	Practice	Research	Clinics	Seminars	Evaluation	Total	Sectors
Anatomy			9			1	1	11	18%
Histology		2	6			1	1	10	
Embriology		2	4					6	
Biochemistry	2	4	2	10		2	1	21	39%
Physiology	6			19		3	3	31	
Pharmacology				6		1		7	
Pathology	1	12				3	2	18	12%
Medicine	2				6	2	1	11	27%
Surgery			3					3	
Obstetrics and Gynecology	2	2		7	9	3	2	25	
Pediatrics									4%
Social Medicine						10		10	
Total	13	22	24	32	15	26	11	143	
									100%

nutrition, health planning and administration, a program of introduction to comprehensive medicine is carried out, the purpose of which is to create in the student the proper attitude in his relations with the patients and their families and with the community itself. The work in the outpatient clinics, in the health center and the rural stations helps the student to understand how a health agency can offer overall assistance to the community, the importance of the group work and the employment of auxiliary personnel and, finally, the need to seek a multidisciplinary solution to the problems of the health sector.

The course on integral medicine of adults is fundamentally designed to prepare the student in the clinical handling of a patient. This knowledge is acquired in the outpatient clinics, home visits and wards. Comprehensive consideration of the clinical and surgical aspects and the practice done in the various areas of supplementary diagnosis make it possible to carry out a total study on each patient.

The next instruction group is concerned with mother-child medicine and points out the importance of integrating obstetrics and pediatrics in a common program carried out in the areas of prenatal, perinatal and post-natal care (growth and development) to offer better assistance to the pregnant woman and her child. Work in the outpatient clinics and pediatrics wards supplement this stage in which the student gains experience in the characteristics of infantile therapeutics and propedeutics at the various age levels seen in pediatrics.

This cycle, which corresponds to the third and fourth year of medical school, is distributed in chart IV.

The Specialized Hospital Unit

The third unit in the School of Medicine, is made up of a 200-bed general hospital located on the university campus, which received patients from the hospital system in the capital. The clinical services are divided by specialities which, in the basic cycle of the school, correspond to the various organic systems.

Working contacts are maintained between the staffs of the two hospitals in such a way that each doctor is assigned to one of them in accordance with his field of activity, and a rotational system has been designed so that he can practice in the other institution.

In the final year of medical school the students may choose between remaining in the integrated health unit, practicing in community medicine, or going to the university campus hospital to follow a rotational internship which includes internal medicine, surgery and an elective speciality.

CHART IV

THIRD YEAR

4 WEEKS	40 WEEKS												
<p>Introduction to Community Medicine</p> <p>40 hours</p>	<p>ADULTS' COMPREHENSIVE MEDICINE</p> <table> <tr> <td>Out-Patient Clinics</td><td>200 hours</td></tr> <tr> <td>Home visits</td><td>60 "</td></tr> <tr> <td>In-Patient Clinics</td><td>250 "</td></tr> <tr> <td>Emergency</td><td>250 "</td></tr> <tr> <td>Clinical Meetings</td><td>160 "</td></tr> <tr> <td>Seminars</td><td>80 "</td></tr> </table> <p>+ - 1000 hours</p>	Out-Patient Clinics	200 hours	Home visits	60 "	In-Patient Clinics	250 "	Emergency	250 "	Clinical Meetings	160 "	Seminars	80 "
Out-Patient Clinics	200 hours												
Home visits	60 "												
In-Patient Clinics	250 "												
Emergency	250 "												
Clinical Meetings	160 "												
Seminars	80 "												

FOURTH YEAR

40 WEEKS	
MOTHER AND CHILD CARE	
Out-Patient Clinics	160 hours
Growth and Development	70 "
Home visits	70 "
Nursery	20 "
In-Patient Clinics	220 "
Emergency	220 "
Maternity	100 "
Clinical Meetings	70 "
Seminars	70 "
	+ - 1000 hours

It should be remembered that all the teaching staff of the School, divided among the three units, carry out their duties full-time, with this as their exclusive occupation. The basic cycle, in which the principal phase of the formal instruction is concentrated, gets the temporary participation of almost all staff members, divided into instruction groups in accordance with the specialized distribution of the blocks. This allows better integration among the clinical and basic sciences professors and a better-applied approach to the whole theme of the instruction, on the basis of which, for example, a clinical cardiologist who is concerned with hemodynamics might perhaps be better able to teach cardiac physiology than a general physiologist whose principal interest is in neurology.

Evaluation

Although we would like to present a detailed analysis of the evaluational process adopted, we will present it briefly. Since it is a question of experimental procedure, we believe that the evaluational process should be given the special consideration which the final observation of the results will make possible.

We also consider that this evaluational process can advantageously be an integral part of the teaching and learning process if it can be presented to the student as a method of self-evaluation of his own yield, rather than as a system of promotion.

Therefore, a continuous and ongoing system of weekly examinations has been drawn up, using multiple choice questions on the subjects studied. These examinations will be held every Saturday and their results discussed in student seminars the following Monday morning.

To the scores made on these examinations is added a grade based on observation of the student in the laboratory and his behaviour in the group work.

Those students who do not attain the required average in the weekly exams are subjected to a general test at the end of the instructional period for each block, so that they may pass to the next block.

In addition, at the end of the basic cycle the students are subjected to another general exam on fundamental aspects knowledge of which is considered necessary to proceed to clinical internship. This exam consists of 300 multiple choice questions.

The same system of periodical exams is continued in the clinical cycle, to which is added greater emphasis on the practical element, including the examination of patients and analysis of clinical cases.

Conclusion

The School of Health Sciences of the University of Brasilia has recently completed its fourth year and in the next six months will graduate its first class.

Even considering that it is quite soon for an adequate appraisal of the outlined plan we should mention, as preliminary observations, the total absence of drop-outs related to the lack of academic achievement and a very high interest of the students in community medicine.

The students' approach to patient care has been - no doubt - easier than in our own former experience with traditional teaching methodology; we attribute this, mainly, to the self confidence developed by students through individual research work during the basic cycle, not only because of a better understanding of the scientific basis of physiopathological phenomena, but also due to the problem-solving oriented type of experience.

From the point of view of costs, it should be pointed out that the characteristics of the program have permitted a relatively low capital investment due to the fact that the requirement in physical facilities has been lower than the established by the usual accepted standards. On the other hand, the equipment used for teaching purposes was remarkably reduced by avoiding unnecessary duplications.

The operational cost by student (US\$1.600) represents approximately 55% of the highest registered in Latin American Medical Schools (US\$2.986)*. Taking into consideration the quality of the product, we may anticipate that, most likely, the studies now in process will show a highly satisfactory cost-benefit ratio.

* García, J.C. "Características generales de la educación médica en la América Latina". Educación Médica y Salud Vol. 3:267-317, October-December 1969