

## WORKSHOP ON MEDICAL EDUCATION

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**Editor's Note:** The task of moulding thirteen thousand words of lecture and discussion into something printable was one which hopefully hasn't destroyed the skill with which many of the comments were made. Some readers may note that the volume is weighted somewhat in favour of Dr. Robinson's introductory discussion on "The Aims of Medical Education." This is because his message sets the tone and lays down the guidelines for later discussions.

### Part I. The Aims of Medical Education by Dr. S. C. Robinson

The most common discussions on this topic begin with the platitude that medical schools should produce good doctors. Or, all too often, the discussant begins by pleading for more and earlier teaching of his particular specialty. Obviously, neither of these approaches lead anywhere. Nevertheless, it does matter very much how we see our task in medical school. For, unless we define it clearly, we can't work out a method to achieve it, nor can we apply a measure to see if we have succeeded.

In order to set the stage for the Faculty's clear set of objectives, let us begin by analyzing some of the questions raised by the platitude, which states:

The aim of medical education is to provide the nation with sufficient good doctors who will help maintain the health of the nation by preventing illness, treating disease, and rehabilitating the ill.

1. Going to the centre of the statement, can we see what is a "good doctor"?

Today's good doctor is supposed to be a paragon. He must try to maintain all the kindly human qualities of old, and yet he must remain an honest scientist who continually seeks time to enhance his skills. Since he can no longer achieve this level across the

board, he must admit his deficiencies, and limit his practice emphasising his area of skill and how many areas there are!

The aim here then is that the student will develop compassion, learn competence, and as well know and accept his role and his limitations.

2. The preceding comment has a corollary, it is "when is a good doctor"?

Osler was obviously a good doctor. But if one treated pneumonia today according to Osler's method, one would be guilty of malpractice. So the question "when is a good doctor?" is relevant only in the context of the date in question. To remain a good doctor after graduation, one must continually select and discard from the mass of new information, so that one can learn from relevant parts of it. His process becomes a way of life, and this is what really counts, not today's facts alone. His way of life then is an aim of medical education.

3. In our statement, we said doctors "will help maintain the health of the nation". This statement implies that a doctor does more than provide a specific service in response to a specific request, any technician could do that. What is implied is that a doctor is **concerned** - he sees a clear responsibility to use his capabilities. So a major aim is to produce doctors who have the kind of concern which motivates them to give the best professional service possible, although knowing full well they could get away with something far less.

4. The next question is: "how is a good doctor?" The good doctor tomorrow is built on the foundation of today. Medical education must focus down and define the knowledge, skills, and attitudes which distinguish this person. Two things must be decided:

1. What is vital and common to all doctors?
2. What must be selected for the individual in the setting of his type of medical work?

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These areas are partially governed, moreover, by such factors as licensing requirements, urban and rural needs, and the needs of service, teaching and research.

The answers to these questions require constant revision and it is very important that the most capable people in the faculties cooperate to do so.

5. Finally, we can ask "By what means is a good doctor?" "How does he learn?"

By and large, medical educators have been long on medicine, short on education. This dual role taxes to the limit the physician who already has a demanding profession. It must be an aim, however, to provide a sufficient variety of educational opportunities, so that virtually all students can learn efficiently. So, an efficient educational process is a vital aim.

Now let us examine the statement of objectives of this Faculty of Medicine.

**Objective 1 :** "The student must accept the responsibility for his own education. He will need to know how to learn for himself, and must accept the importance of learning continued throughout life, in order to effectively discharge his responsibility to the community."

**Objective 2 :** "The student must acquire a basic knowledge of medicine and must demonstrate his ability to use this knowledge to solve problems, including those to which he may not have had prior exposure. All students will be expected to go beyond this basic knowledge in some field of study, but all must achieve the minimum requirement."

**Objective 3 :** "The student should learn how the resources of the community may be utilized in the optimal health care of his patients. He should recognize that health care is the responsibility of a team of individuals with whom he will work in providing patient care."

**Objective 4 :** "The student should acquire attitudes essential for his function as a physician. These include compassion and perceptiveness in the care of patients, understanding the fundamental rights of the patient, intellectual honesty, and a willing acceptance of the responsibility for the initiation and continuing co-ordination of all efforts directed toward the patient's problems as they relate to his health."

Many of these attitudes come with us to Medical School, and are, more often than not,

a basic reason for choosing our medical career. The pressure of study as a student, and of practice as a doctor, can erode these qualities. But if they are lost, the force which drives the doctor on to work in the highest traditions of the profession is gone, and the individual functions in some other way.

## Part II. Basic Science - Methods of Education by Dr. G. R. Langley

The present Secretary of Defence in the U.S., Robert MacNamara, has defined basic science rather aptly as "the kind of research which is most widely applicable." If we translate this into educational programs, we might justly expect a basic science education to concern itself with processes and principles which have "wide applicability." Wide applicability for students, who having chosen a career in medicine, want and need a basic science for this profession. In the first two years, the student in medicine may not know what basic science is necessary for his later functioning, which will span four decades. In these circumstances we have to help him recognize his need, since it is the motivated, interested student who learns best.

Before proceeding, it is necessary to provide some background on the basic science employed by clinicians, and how these basic science concepts were learned.

I first learned about the effect of certain pesticides on bone marrow function, and of the tumoricidal effect of that interesting enzyme L-asparaginase, from patients. This may not be the usual way we receive new information, but it is not uncommon. More often, clinical scientists obtain their new information from journals, colleagues, and scientific meetings. No matter where heard, there is a common feature - the hearing of it is not the learning of it. True learning is the ability to manipulate information to employ it to solve problems. This process requires time, motivation, and participation.

You may think that you have up-to-date basic science information, and that new concepts will be infrequent. I suggest, however, that you will be caught up with this problem as present day clinicians have been. For example, what do you know about hereditary serum lipo - protein patterns of normal man, or about the small bowel paneth cell? These

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are new concepts, disturbances of which today seem perhaps destined to be important in patient care programs. Thus you can see that our basic science knowledge is ever changing - we know that every year we must update our knowledge, I suggest, therefore, that because of this background we should propose two objectives for basic science programs:

**Objective 1 :** That we learn in the basic sciences how to find new information, how to find it quickly, and having found it, how to learn it independently. By learning, I mean the ability to use it - to apply it to solve problems.

**Objective 2 :** That students learn the scientific method, that is, the proposal of an hypothesis, the collection of data, often by statistical methods; for the clinical method you use in later years is the same. Of course, I don't mean that you just read how others use the scientific method. You must use it yourself, over and over again as participants.

Finally, I would like to present one method to achieve these basic science objectives both in the basic science and clinical departments. If eventually as a physician you must interpret new data by independent study, do you think it is possible to start this process in first year? Could you learn how genetic mechanisms exert their control by attempting to solve for example, the problem of sickle cell anemia? While the problem has been solved for most of us, we must remember that for the student this is a new problem. The student who works out the mechanisms of sickle cell anemia by himself would gain these things: 1. Probably the same knowledge as if he were told. 2. The ability to use resource material. 3. The emotional satisfaction of discovery and confidence in his ability to solve problems using resource material.

### Part III Clinical Sciences - Methods of Education by Dr. R. N. Anderson

I would like to begin by defining medical education as "planned change in behaviour of the medical student." Furthermore, Whithead has said that education is "the acquisition of the art of the utilization of knowledge". Factual information acquired by the student, therefore, is only truly learned when he can utilize it in his relationships to patients and

their problems.

It is essential that we pay attention to at least some of the principles related to the learning process.

1. It is generally agreed that learning is an individual thing. One can transfer knowledge but not understanding.

2. Motivation is a significant factor in learning.

3. Active participation by the student is preferable to passive reception.

4. Meaningful materials and tasks are learned better than nonsense material. The student should see the significance of the materials being studied.

5. There seems to be no substitute for repetitive practice in the over-learning of skills.

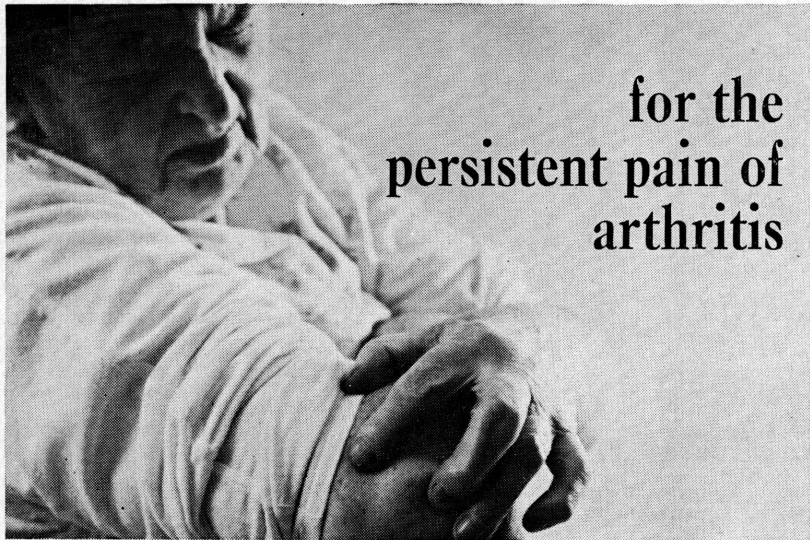
6. Feed-back in general, but especially positive feed back, aids learning. Dr. Waugh will be discussing this in more detail.

I shall now turn to the goals of the clinical experiences. The instructional objective in Clinical Cardiology is as follows: "The student is expected to be able to approach any patient with a symptom or sign as a problem in disturbed function, and to be able to collect and evaluate sufficient data concerning the problem to determine what further steps need to be taken in the best interests of the patient."

With this background let us turn briefly to the curriculum itself, to the actual learning experiences.

(a) **Timing and Emphasis:** I believe the present system should be modified so that the student is introduced to the patient on his first day in medical school. The **emphasis** in the first year should be towards basic science, especially towards the normal. With the basic sciences providing a good background during all four years, clinical problems of gradually increasing complexity should be introduced, **beginning** in the first year. Management can certainly be mentioned, though not stressed, from the student's first day. Finally, some way should be found to give some responsibility for patient care to students early in their training. Responsibility makes relationships with patients more meaningful.

(b) **The Nature of Learning Experiences:**  
1. The actual form of the knowledge transfer is not as important as the existence of a **variety** of methods to suit the taste of individual students.



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2. Understanding, on the other hand, cannot be transferred from one individual to another. In this regard, the discussion group is the common form used in clinical practice. Let me draw an analogy: One can get very little idea of what a house looks like if one looks at it from one view. However, if one walks around it, flies over it, and walks through it, one can get a reasonable idea as to the nature of the building. The group discussion is similar to this. Each participant gives a slightly different perspective as to the nature of the concept involved.

3. The clinical setting provides an ideal opportunity for problem solving and the acquisition of skills.

4. If the attitude which the student brings with him into medical school is not to deteriorate, the attitudes which ought to be held by physicians must at least be partly shared by the professional personnel with whom the student is in contact.

#### **Part IV Evaluation in Medical Education by Dr. D. O. W. Waugh**

As is my custom, I would like to begin with a definition. That is, that evaluation is an assessment of the value of education, and a determination of the effectiveness of the educational process. Ultimately then, we are trying to measure progress towards the goals which Dr. Robinson has already outlined.

In general, there are four characteristics which evaluation procedures should possess. These are:

1. **Validity:** Do the procedures measure what the faculty thinks they measure?

2. **Reliability:** Evaluation procedures should yield results which are reproducible and which are consistent.

3. **Objectivity:** A test is objective if, when it is administered by different teachers to the same group of students, more or less the same results are obtained.

4. **Practicability:** Is the construction, administration and marking of the procedure within the resources of the institution?

Now, in addition, there are a number of extraneous factors which come into evaluation procedures. The examiner must be aware of these factors, otherwise they can become prominent to the extent that they dominate the evaluation. These situations

include: 1. Exams which primarily test the individual's ability to follow directions. 2. Exams which overpoweringly test the individual's ability to understand the English language. 3. Procedures which are dominated by testing the person's ability to see through traps. 4. Exams which are used as disciplinary measures. This practice is, of course, most deplorable.

Without spending much time on the various techniques of evaluation, most of which you're familiar with, I would like to comment on one which isn't used much, called a peer rating. Students are asked to evaluate each other, and it is my impression that classmates can evaluate each other better than any of the procedures used by their teachers.

More important than the techniques of evaluation, however, are the methods by which they are applied and the use which is made of the results. Most importantly, I think that students must know in advance what's expected of them in the evaluation procedures being applied. They should know the objectives of the school and of the course, and in a general way how the measurements are going to be made. Moreover, the teachers involved, as well as the student, must know these rules of the game.

Emphasis must also be placed on the need for communication between the teacher and the learner. There has to be an atmosphere of mutual understanding and sympathy where the faculty doesn't regard the student as the enemy, and vice versa. The resulting dialogue should lead to worthwhile changes on both sides.

Finally, I'd like to indicate some of the things we can hope to learn from evaluating procedures. Firstly, we get an indication of the students' fitness to proceed to other areas of learning. Secondly, I think teachers can detect from exam results improvement or deterioration in their teaching ability, over a period of time. In other words, they can learn how to be more effective and therefore, better teachers. Thirdly, evaluations can indicate areas of strength and weakness in individuals and in classes as a whole. With this information the educator can assist students in their weak areas, and encourage them to pursue in greater depth things at which they have shown ability.



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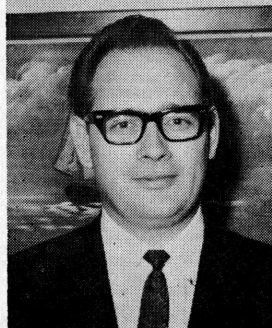
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