THE NEWCASTLE UPON TYNE MEDICAL CURRICULUM

An Experiment in Medical Education*

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S. Afr. Med. J., **45**, 770 (1971).

In the United Kingdom the General Medical Council sets down standards which must be maintained in the education of medical students. Periodically the Council reviews the recommendations it makes on this matter and between 10 - 15 years ago the Council introduced a certain flexibility in the recommendations which made it possible for individual medical schools to embark on a series of experiments in medical education.

In Newcastle upon Tyne the Faculty of Medicine agreed that this was a time for radical review of the undergraduate teaching programme and a sub-committee was appointed to review the training of medical students and to make recommendations for a new curriculum. A strict time-limit was set and the sub-committee was given 6 months to complete the task. In due course firm proposals were made to the Faculty of Medicine and a full curriculum committee was set up to deliberate the proposals and to agree on the final form of the new curriculum. After careful deliberation the structure of the new curriculum was finally decided and came into operation in October 1962.

As I look back over the years I am quite sure that Faculty acted wisely in placing a time-limit of 6 months upon the sub-committee's deliberations. Had it not been for this time-limit I think there would have been considerable delay in instigating major changes in our curriculum.

Sub-Committee's Views

In making recommendations to the Faculty of Medicine the sub-committee set down views on the qualities and knowledge that a doctor should possess on qualification:

1. He should have developed an attitude to Medicine which is a blend of the scientific and humanitarian.

2. He should be trained in the scientific method knowing that conclusions should be reached by logical deduction and that evidence must be assessed both as to its relevance and reliability.

3. He should be imbued with the high ethical standards required of a doctor dealing with patients and their relations with sympathy and understanding.

4. The young doctor must possess a knowledge of the structure, functions and development of the human body, of the factors which may disturb them and the disorders of structure and function which may result.

5. In the clinical field he must have learned how to elicit facts from a patient and should have a good knowledge of those diseases which are an acute danger to life as well as those which give rise to chronic disability. He should recognize the limitation of his own clinical knowledge and be prepared, where necessary, to seek assistance.

6. He ought to understand the effect of environment on health and appreciate the responsibility of his profession for the prevention of disease.

7. Finally he should appreciate that Medicine is a continuing education and that he has an obligation to remain a student and contribute if he can to the progress of Medicine throughout the whole of his professional career.

In addition to these primary objects the sub-committee also accepted certain guiding principles which they considered should be kept in mind in following a new curriculum.

(i) The achievement of as great a degree of integration as is possible and sensible during the various stages of the curriculum.

(ii) It should be clearly understood by all teachers that there is a limit to the amount of factual information the undergraduate is required to assimilate.

(iii) Throughout the curriculum a reasonable amount of free time should be made available to the student.

(iv) There are educational advantages for students who undertake some form of 'depth' study or enquiry.

(v) The form and organization of the curriculum should be kept as simple as possible.

(vi) Constant appreciation by staff members that the enthusiasm of the teacher is more important than the form of the curriculum.

ADMINISTRATIVE STRUCTURE OF NEW CURRICULUM

Students entering medical school in Newcastle upon Tyne have already taken 'A' level Biology, Physics and Chemistry at school and those subjects are not taught in medical school. The new curriculum comprises 4 stages and the timing of these is set down in the accompanying table.

TABLE I. BASIC TIMETABLE

	1st Term (*Michaelmas Oct. - Dec.*)	*2nd Term* (*Epiphany Jan. - Mar.*)	*3rd Term* (*Easter April - June*)	(*Summer Vacation July - Sept.*)
1st year	I	I	I	Vacation
2nd year	I	II	II	III (Elective)
3rd year	III	III	III	III (Elective)
4th year	III	III	III/IV	IV
5th year	IV	IV	IV	

Summary of Study Course for Stage I

The Stage I course occupies a period of 4 terms (36 teaching weeks) and involves approximately 1 000 hours of teaching. Aside from the Christmas, Easter and Summer vacations (21 weeks) the students are allocated not less than 3 hours of free time each week, in addition to Wednesday afternoons and Saturday mornings. The course

*Paper presented at the 48th South African Medical Congress (M.A.S.A.) March 1971.

is concerned with the study of (*a*) human structure, function, development and growth, (*b*) human psychology and (*c*) the structure and function of human society.

The course is planned in broad outline by the Stage I Committee. Co-ordination and integration of study of the various systems is done by systems sub-committees. The Stage I course includes a section on the structure and function of human society. This course occupies 20 hours and within the limits of time available a generally satisfactory pattern has been worked out. Five related themes are presented by a range of teachers coming from Departments of Law, Sociology, Politics, Education and those branches of Medicine with substantial social concern. The aims are to introduce the student to some of the concepts of sociology related to Medicine. It is intended to illustrate how the well-being of the individual both influences and is influenced by society. The Stage I professional examination is taken at the end of the Stage I course and consists of 2 papers, both containing essay-type questions—a wide choice is given. There is also an oral examination. In this examination, both in the essay questions and in the oral, the theme of integration is a strong feature. In addition, an in-course assessment is given by the Departments of Anatomy and Physiology and this is taken into account in the Stage I examination.

Summary of Study Course for Stage II

Stage II occupies the fifth and sixth terms of the curriculum and comprises introductory courses in Microbiology, General Pathology, Pharmacology, Environmental Medicine and Biostatistics, Clinical Biochemistry and Hospital Orientation. It covers the transition from the study of normal structures and function to systematic clinical work. The Stage II examination, which is also highly integrated, consists of 2 essay-type papers and an oral examination.

Summary of Study Course for Stage III

Introduction. The Stage III course occupies five and one-third university terms together with 2 summer periods and is divided into systematic and clinical parts. Integrated, systematic teaching of various systems is given 4 afternoons per week during university terms and the mornings are occupied by clinical teaching in wards, outpatient departments, operating theatres, etc.

The professional examination related to Stage III constitutes Part I of the final M.B., B.S., and is taken in May of the fifth academic year. A repeat examination is held in December of the same year. Students are not admitted to the Final Year until this examination has been passed. The Part I final examination is essentially concerned with the systematic teaching which has taken place in Stage III and is not a clinical examination. The examination consists of a multiple-choice question paper (60 - 70 questions), 2 essay-type question papers and an oral examination.

TABLE II. FINAL (PART I) M.B., B.S. EXAMINATION—PAIRINGS OF EXAMINERS IN ORAL EXAMINATION

Example 1	Medicine Microbiology	one pair	one panel
	Obstetrics and Gynaecology Pharmacology (external)	one pair	
Example 2	Anaesthetics Clinical Biochemistry (external)	one pair	one panel
	Paediatrics Social and Preventive Medicine (external)	one pair	

Systematic teaching. Formal teaching consists of a series of interdepartmental courses based on systems of the body. This series replaces all former systematic lectures in medicine, surgery, obstetrics, gynaecology, child-health, psychological medicine and in the various special branches of these subjects. In addition the courses cover systematic instruction in pathology, microbiology, clinical biochemistry and pharmacology together with some of that in anatomy and physiology. It has been found necessary to retain a small number of separate lectures in anaesthetics, community and environmental medicine, pharmacy and toxicology.

There are 14 such interdepartmental courses. The titles and approximate duration of these are shown in Table III.

TABLE III. INTERDEPARTMENTAL TEACHING IN STAGE III

Skin	20 hours
Specific infections	28 hours
Metabolism nutrition and endocrinology	50 hours
Skeletal and locomotor systems	30 hours
Gastro-intestinal and biliary tracts	50 hours
Blood and blood forming organs	25 hours
Urinary tract and male genitalia	30 hours
Heart and vessels	50 hours
Lungs and respiratory tract	30 hours
Central nervous system	38 hours
Mind	30 hours
Eye	15 hours
Ear, nose and throat	15 hours
Female reproductive system	55 hours

These courses are organized and administered by 14 corresponding working parties, who are also largely responsible for the actual teaching. Each working party consists of a chairman-convener, together with representatives of each interested University Department, the latter being nominated by the departmental head. The working parties are responsible in the first place to a sub-committee of the Medical Curriculum Committee known as the Stage III Sub-Committee, the constitution of which includes all heads of university departments and all working party chairmen.

The basis of each course is integrated interdepartmental teaching on the topic concerned. Every effort is made to keep the format as varied as possible, and in addition to formal lectures there are panel discussions, demonstrations, seminars, films, histological sessions with individual microscopes, etc. This 'topic' teaching takes place on Monday, Tuesday, Thursday and Friday afternoons and lasts from 1400 to 1630 or 1645 with a half-hour break for tea. The programme for each afternoon is prepared by a 'co-ordinator' (a senior member of staff) who may actively participate or simply act as chairman for the afternoon. Careful provision is made for students' questions during the afternoon or at the end of the session. Examples of afternoon programmes are given in Table IV. The various teachers named are present throughout the afternoon session.

In addition, standing demonstrations are organized in connection with each course, consisting of photographs, drawings, X-rays, pathological specimens and anatomical models (Figs. 1, 2 and 3).

Clinical appointments. Throughout Stage III, mornings are occupied by clinical appointments. These fall into four phases. Phase I occupies the first 3 weeks of the summer period of the third academic year, beginning at the end of the Easter term. During this phase the students learn the techniques of history taking and physical examination.

Phase II occupies the whole of the fourth academic year together with the latter part of the preceding summer period, and comprises 44 weeks. Fixed holidays at Christ-

Fig. 1. Visual aids mounted on movable screens to augment integrated teaching in Stage III.

TABLE IV. EXAMPLES OF PROGRAMMES

	Heart and Vessels	
Session VIII		
1400 - 1430	Anatomy of heart valves (demonstration)	Anatomist
1430 - 1520	Active rheumatism (lecture)	Paediatrician
1545 - 1645	Pathology of rheumatic valvular disease (practical)	Pathologist
	Heart and Vessels	
Session IX		
1400 - 1430	Haemodynamics of mitral valve disease (lecture demonstration)	Cardiologist I
1435 - 1520	Clinical features of mitral valve disease (lecture)	Cardiologist II
1520 - 1525	Radiology of mitral valve disease (demonstration)	Radiologist
1600 - 1645	Treatment of mitral valve disease (joint lecture)	(Cardiologist (Cardiac Surgeon
	Human Reproduction	
Session XIX—Insults to Foetus *in utero*		
1400 - 1415	Introduction by Obstetrician	
1415 - 1500	Pharmacologist Radiologist Virologist	
1530 - 1600	Paediatrician	
1600 - 1645	Round table conference Questions invited	

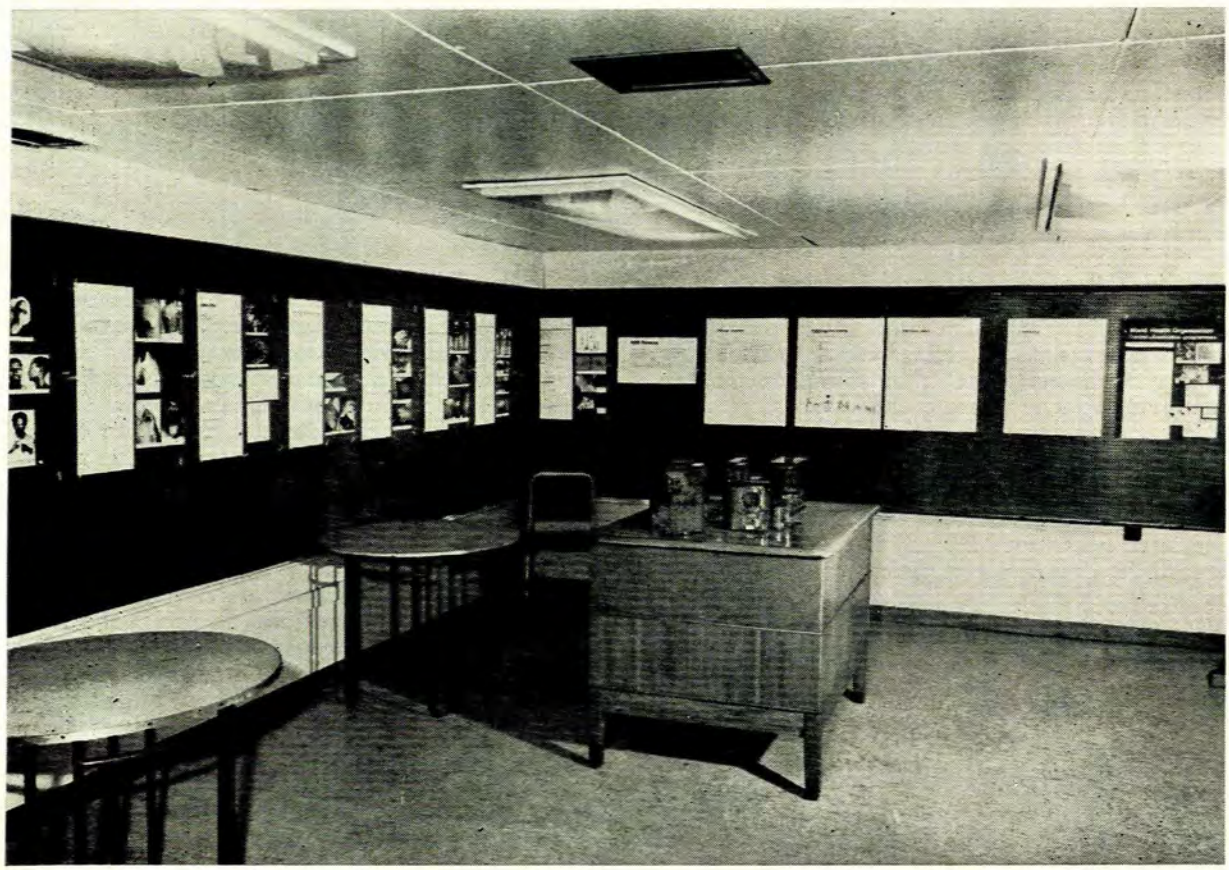


Fig. 2. Stage III teaching—demonstration mounted on wall boards.

mas and Easter account for 4 weeks, leaving 40 weeks during which rotating clinical appointments are fulfilled as follows: General Medicine 10 weeks; General Surgery 10 weeks; Family and Community Medicine 5 weeks; Accident Room, Fracture Clinic and Radiology 5 weeks and Paediatrics 10 weeks.

Phase III is the 14-week summer period of the fourth academic year. During this phase the student is allowed to choose his own activity. Under the terms of this elective appointment, a wide choice of pursuit is allowed, subject to the approval of the Dean of Medicine. A member of staff has been specially appointed to assist students in making a choice and in any travel arrangements necessary. During the first years of operation of this scheme, the large majority of students have elected to pursue clinical appointments, in many cases abroad (Table V). They are, however, equally encouraged to do laboratory work or to pursue their research projects.

Phase IV accounts for the remaining period of Stage III, amounting to 28 weeks from the beginning of the Michaelmas term of the fifth academic year exclusive of holidays at Christmas and Easter. During this phase, the following appointments are taken in rotation: Psychiatry 7 weeks; Gynaecology 7 weeks; O.P. Neurology 3½ weeks; O.P. Dermatology 3½ weeks; O.P. Ophthalmology, O.P. Cardiology, Dental Surgery and Practical Pharmacy 3½ weeks and Pathology clerking 3½ weeks.

During the whole of Stage III, optional clinical lectures take place at 1200 on week-days during term time. These lectures, which are open to any medical student who wishes to attend them and who is free to do so, cover a variety of subjects but 2 of them each week are related to the current afternoon's systematic teaching. The remainder are allotted in turn to the various clinical disciplines.

Free time. During the whole of Stage III, 3 full days each week (Wednesday, Saturday and Sunday) are left free of any commitment in either systematic or clinical teaching. The student is encouraged to use this free time for private study or for work on a special study project.

Special study projects. On entering Stage III each student receives a booklet setting out class 'A' and class 'B' projects available in each department along with detailed instructions about the time available, etc. Class 'A' projects are more sophisticated and generally include laboratory work. The student who elects to do a project can spend his 'free time' over the next 2 years on this work. These are voluntary projects and do count towards Honours though not taken into account at ordinary pass level in the final examinations.

Summary of Study Course for Stage IV

The period of study for Stage IV is one year, beginning in early June. The last 4 weeks are left free for revision. There are 2 weeks of holiday in the summer and one week at both Christmas and Easter. This leaves 11 4-week periods, which are occupied by the following whole-time clinical appointments: General Medicine 2 periods; Special Medicine 1 period; General Surgery 2 periods; ENT and Anaesthesia 1 period; Obstetrics 2 periods; Child Health 1 period; Psychiatry 1 period and Elective appointment 1 period.

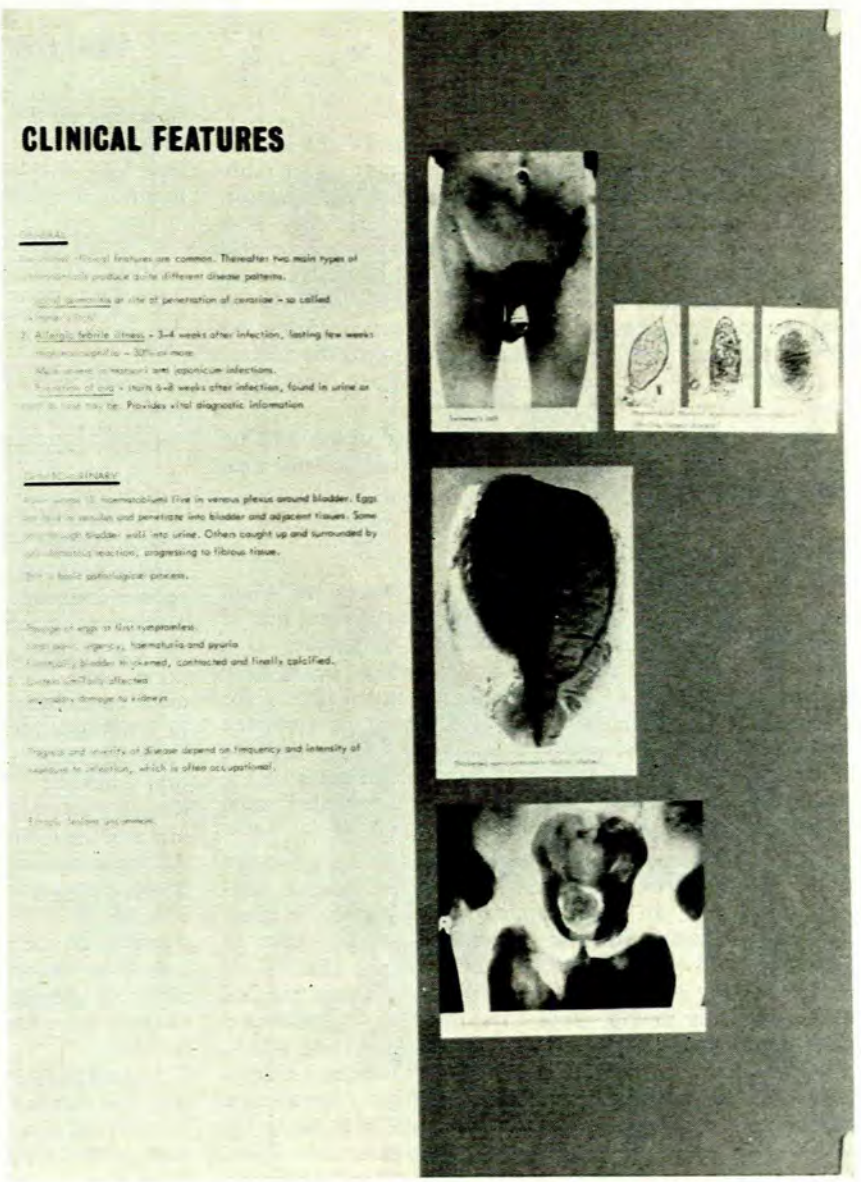


Fig. 3. Stage III teaching—close-up of part of wall demonstration.

TABLE V. STUDENT ELECTIVES OVERSEAS

	1965	*1966*	*1967*
Australia		1	
Canada	4	4	4
Denmark	1	1	
Fiji		1	1
Finland			1
France		1	
Germany	2	1	1
Holland	1		
Iceland			1
India			1
Israel			1
Malawi	1		1
Malaya		1	
Malta	2	1	1
Nigeria	1		
Norway	1	1	1
Sweden	3	1	2
Switzerland		1	
Uganda	1		
USA	13	22	31
Zambia		1	1

During the various attachments in Stage IV the student is free from other commitments and acts as a 'sub-houseman' with clearly defined (though limited) responsibilities. Again during these Stage IV attachments there are never more than 2 students (generally one) appointed to any ward or 'firm'—this allows chiefs and staff members to get to know students well (and vice versa). At the end of each attachment in this final year, students are given an 'assessment' by the chief according to the following grades: A—Honours standard; B—good pass; C—pass; D—bare fail; and E—bad fail.

These grades are translated into marks which add up to a significant percentage of marks given in the final examination (Part II).

Final Examination (Part II)

At the end of Stage IV the student takes his Final Examination (Part II) which is essentially clinical and if successful he graduates M.B., B.S. and progresses to a compulsory pre-registration year after which he is fully registered with the General Medical Council. Posts for recognition in the pre-registration year must be approved by the University and during this time the young doctor's education continues and he is still under the aegis of the University; these appointments must be concluded satisfactorily before GMC recognition is given.

Part II of the final examination consists of a written paper (multiple-choice questions), a principal case, a 'physical signs' case, an oral examination and credit is given for course assessments. The 'weighting' given to each of the component parts of the final examination (Part II) is obviously very important. The curriculum committee has deliberated this matter most carefully and has allocated more marks to those parts of the final examination which, in their opinion, are better measures of assessing students ability. These 'weightings' are reviewed from time to time in the light of experience which is steadily building up within the Faculty of Medicine in Newcastle upon Tyne. In view of the fact that these are very confidential matters, the 'weightings' are not given here.

In this examination, as in all others throughout the curriculum, the theme of integration is maintained. This is illustrated in the following table by showing the pairings of examiners. And in the multiple choice questions the 'stem' and the alternatives are interdisciplinary.

TABLE VI. FINAL (PART II) M.B., B.S. EXAMINATION—ALLOCATION OF EXAMINERS FOR ONE CANDIDATE

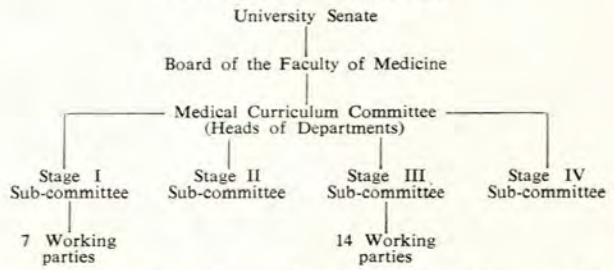
	Example 1	*Example 2*	*Example 3*
Principal Case	Surgeon Paediatrician Ophthalmologist	Psychiatrist (E) Physician	Surgeon (E) Physician
	↓	↓	↓
Physical Signs	Paediatrician (E) ENT Surgeon	Physician (E) Orthopaedic Surgeon	Gynaecologist Dermatologist
	↓	↓	↓
Oral	Surgeon (E) Physician	Paediatrician (E) Obstetrician	Physician (E) Paediatrician

E = external

THE ORGANIZATION OF THE NEW CURRICULUM

In setting up this new curriculum the Board of the Faculty of Medicine was concerned that there should be flexibility and this is reflected in the organization established to monitor the curriculum.

TABLE VII. ORGANIZATION



The 4 'Stage' committees through their various working parties keep all parts of the curriculum under constant review and make alterations to detail as required. Major alterations of principle or in timing can only be made by the Board itself. A feature of this curriculum in Newcastle upon Tyne is the opportunity given to students to comment upon every aspect of their teaching. Formal comment in writing is invited after the various courses and if the student wishes his observations can be anonymous. Again oral evidence is invited by the 4 Stage Committees and elected student representatives are given the opportunity of meeting the Committee to discuss the teaching programme. At these meetings the students draw up the agenda and 'make the running'. I must record that my colleagues and I have, over the years, been much impressed by the maturity of the students and by the articulate and helpful way they have presented their observations. As a direct result of the students' comments a number of important changes have been made in the form and content of their training.

In summary I would say that staff and students believe that this curriculum, in general, has been successful. Points of criticism have been discussed frankly and freely by the staff often in conjunction with students and the inherent flexibility of organization is undoubtedly a useful and at the same time strong feature of the teaching programme.