

PART ONE

MEDICAL & DENTAL EDUCATION IN NIGERIA

CHAPTER 1

INTRODUCTION

Preamble

One of the statutory functions of the Medical and Dental Council of Nigeria [hereinafter referred to as 'Council'] is to approve the institutions at which courses of training are to be given for persons who are seeking to become members of the Medical and Dental professions as well as the courses of instruction prescribed and the qualifications to be granted by such institutions. Council also has the responsibility for supervising the nature of the instructions and the examinations leading to the qualifications to be granted in these cases (*vide* Medical and Dental Practitioners Decree No. 23 of 1988, Sections 1[2a], 8 [1a & b] and 9 [1, 3 & 4]). In addition, Council is responsible for supervising the instruction and examination of practitioners of alternative medicine in fields such as Acupuncture, Chiropractic Medicine, Homeopathy, Osteopathy and other fields as Council shall specify from time to time. After several reviews, the enabling Act is now CAP M8. In pursuance of these duties, the Medical and Dental Council of Nigeria sends visitation panels from time to time to inspect newly established medical schools with a view to formally approving their training programmes as required by the law. Thus in 1974, and again in 1977, visitation panels from the Council inspected the clinical facilities and programmes of the College of Health Sciences, of the University of Ife (now Obafemi Awolowo University). Similar visitations had also been made subsequently to the medical schools of the Universities sited at Maiduguri, Port Harcourt, Ago Iwoye, Awka and Calabar.

These panels duly submitted their reports to Council. Arising from the experience of these visitation panels and discussions of their reports by the Council, it became very clear to Council that the time had come to spell out clear guidelines on the development and maintenance of minimum standards of Medical Schools, old or new, in all aspects of training considered by the Council, to be essential for the efficient practice of medicine and dentistry in Nigeria. Recent developments, such as further increases in the number of medical schools, increased attrition of medical academic personnel, global advancement in the professions of Medicine and Dentistry and economic policies of government have made it necessary to further revise these guidelines.

Definitions

It is necessary to explain the use of the terms "Medical School" "Medical Education", and "Standard" for the purpose of this exercise. The terms "**Medical School**", "**School of Medicine**", "**Faculty of Health Sciences**", "**College of Medicine**" and "**College of Health Sciences**" are used synonymously in Nigeria, sometimes in a restrictive sense, with reference to institutions which cater for the education of medical doctors or physicians and dental surgeons only; at other times in a comprehensive sense, with reference to institutions which cater for the training of a wide range of health personnel – doctors, dentists, nurses, pharmacists, physiotherapists, *etc.* The Medical and Dental Council of Nigeria is concerned with the training of doctors and dental surgeons as well as practitioners of alternative medicine only. Therefore, its statutory functions as regards training relate to that part of the Medical School, Faculty or College of Health Sciences, which deals with the

education of the physician and the dental surgeon, though it recognizes the desirability of such schools, faculties or colleges to train other cadres of health personnel to maximize their potentials, facilitate the team spirit in health care delivery and meet national needs.

Two dictionary definitions of the term “standards” are relevant to this exercise. The Concise Oxford Dictionary defines the term as “degree of excellence *etc*, required for a particular purpose; things recognized as model for imitation”. Webster’s Third New International Dictionary defines it as “something that is established by authority, custom or general consent as a model or example to be followed; a definite level or degree of quality that is proper and adequate for a specific purpose”.

Two major themes run through these definitions. The first is that of a model of excellence which is to be imitated or followed. The second is that the model of excellence is accorded such recognition for specific purpose. This implies that STANDARDS must therefore be related to define OBJECTIVES, and any attempt to prescribe standards must begin with a statement of objectives. In a comment on medical education, Mosha Prywes wrote in 1973 “Medical Education is not an aim in itself; it is a mission-oriented endeavour that can be judged only by its contribution to society predominantly by improving a nation’s health and by developing new models of medical care”. Thus, standards in medical education must be related to the needs of society or the community needs which may vary with time and from one part of the world to another. The same concept was aptly expressed by the General Medical Council of the United Kingdom of Great Britain and Ireland when it stated that: “The Council’s responsibility lies in its duty to indicate the general requirements and the standards which in contemporary conditions, ought to be achieved and maintained in the public interest”.

Thus, it is clear that although there are fundamental requirements of medical education which may be considered to be universal in their applicability, much cognizance must be taken of the health needs of a nation and of the organization of health services required to provide services to meet those needs in any attempt to prescribe the standards of medical education within the nation.

Case for Collaborative Effort in the Planning of Medical Schools in Nigeria

For the foreseeable future in Nigeria, both Universities and Medical Schools or Colleges of Medicine/Colleges Health of Sciences, are likely to continue to be conceived, planned, developed and financed by the Government, be it Federal or State, although a few private medical schools are on board now. The Medical and Dental Council of Nigeria is an agent of Government, performing its statutory functions by the authority of the Government. In practice therefore, it is undesirable for Council to exercise its powers to deny recognition to a Medical College conceived, planned, developed and financed by the same Government. In the last analysis therefore, in respect of its functions of approving and recognizing Medical Schools and Colleges in the nation, there is a danger that the Council may become a mere rubber stamping agent.

To avoid such an undesirable development, it is essential that the Council’s style of operation in respect of this particular function must change from one of inspection, report and judgement, to one of active involvement in the planning process of these Medical

Schools and Colleges in order to ensure, in a prophylactic way, that its guidelines of minimum standards are followed. To this end, two things must happen:

1. These *Guidelines of Minimum Standards* which Council expects all existing and prospective institutions to attain must be clearly defined and widely circulated within all Government and University circles.
2. The Medical and Dental Council of Nigeria, along with other relevant agencies, ought to be involved in the initial plans for setting up a Medical School. Under the current arrangement, these other agencies are:
 - The University Faculty, Senate and Council.
 - The National Universities Commission.
 - The Federal Ministry of Health

Rather than expect the University Institution to deal with each of these bodies in turn in any expedient order as currently happens, an integrated planning machinery involving all of them together is desirable and should be made mandatory for efficient, effective planning.

CHAPTER 2

DEVELOPMENT OF THE BASIC PHYSICAL AND OTHER TRAINING FACILITIES

Historical Perspective

One of the three major critical factors on which the question of adequacy or otherwise of the standard of training in any medical school depends is the availability of physical facilities in the form of buildings and equipment. Provision must be made for this, both in terms of capital as well as recurrent costs. The other factors are availability of qualified teachers and the quality of students selected. This chapter and the next will examine the issue of basic physical facilities that are adequate for the standards expected of graduates at the end of their training. In this connection, it is pertinent to recall that when the Ibadan Medical School was established in 1948, the original intention was to expand and to improve the physical facilities of the Government Hospitals in Ibadan (Adeoyo, Jericho General, Jericho Annex and the Infectious Diseases Hospitals) to a standard acceptable to the University of London and the General Medical Council of Great Britain whose degrees were expected to be awarded to the students due to be trained at these institutions. The proposed improvements and expansion were duly carried out, but a visitation from London in 1950 found, after due inspection, that the physical facilities were below the standards required for students training for the London MBBS and it was the report of the visitation that forced the Ibadan students to be transferred to teaching hospitals in London and other centres in the U.K. for their clinical training for a number of years until the time when an entirely new 500 bed teaching hospital – now University College Hospital (UCH) Ibadan – was built and opened in April 1957.

The joint responsibility of University authorities in Nigeria and the Medical and Dental Council of Nigeria, in ensuring that the standards of the institutions intended for the training of medical students in Nigeria are adequate for the purpose, is no less today than that of their counterparts when faced with the Ibadan situation in the 1950s. Between them, they share the onerous duty of making sure that the desirable objective of establishing more and more medical schools in different parts of the country is matched with the provision of sufficient resources to guarantee the maintenance of appropriate standards of medical education already attained by older schools such as Ibadan and Lagos. In fact, with the same objective in view, Council had, as far back as 1972, laid down a set of minimum requirements which a teaching hospital must have by way of physical facilities. This list served as a useful guide up till 1984 when it was revised, especially in situations where Government General Hospitals have had to be taken over for use as teaching hospital, and pressure has been put on the authorities to convert such institutions quickly into teaching hospitals, almost overnight. Thus Enugu Teaching Hospital, Ahmadu Bello University Teaching Hospital, University of Calabar Teaching Hospital, University of Ilorin Teaching Hospital, University of Port Harcourt Teaching Hospital, Obafemi Awolowo University Teaching Hospital and Ogun State University Teaching Hospital have had to be developed in this fashion. It has become necessary, however, to review this list and update the requirements in the light of experience, to enable the new medical schools currently being established draw readily from the experience of the older medical schools in the planning and development of the basic physical plan of their institutions.

Basically, there have been two approaches, to the problem. **Ibadan, Benin** and later **Maiduguri** and **Sokoto** medical schools have had the unique advantage of having new teaching hospitals that were specifically planned, built and equipped for the purposes before the first set of clinical students were ready to start their clinical training. On the other hand, Ahmadu Bello and Enugu Medical Schools have been turning out medical graduates since 1971 and 1975 respectively, while the arguments about building new teaching hospitals for them dragged on for decades before they moved into their permanent facilities more than 30 years after their establishment. It is more than likely that the latter approach, namely that of asking the new medical schools to take over existing hospitals in their immediate neighbourhood and to modify them to suit their requirements, is the one that will commend itself more readily to the policy makers in the immediate future for various reasons. Therefore, a very clear duty devolves on Council to lay down clear and unequivocal guidelines and conditions which will safeguard standards of medical education in the country in such circumstances.

The second major critical area which has a bearing on the question of minimum standards of medical education in Nigeria is the problem of recruitment of teachers. The problem of the lack of teachers in some vital areas of the training programme in some of our medical schools is very acute, and is likely to get worse as more and more new schools are established. These vital areas include the basic and pathological sciences (especially histopathology), forensic medicine, the public health disciplines and some surgical and medical specialities such as anaesthesiology, otorhinolaryngology and psychiatry.

Guidelines for Development

In view of the hard lessons of history outlined above, Council is of the firm opinion that medical schools must not be the product of *ad hoc* establishment on the basis of political considerations without adequate planning.

As indicated above, coordinated planning involving the University, the National Universities Commission, the Federal (or State) Ministry of Health (especially the Planning, Research and Statistics Directorate) and Council must be a *sine-qua-non* for the genesis of any medical school.

Furthermore, in the Nigerian context, it is necessary to insist that realistic planning of medical schools must be based on two fundamental sets of data:

Population Base

An 'ivory tower' medical school with no involvement in, or commitment to, service has no place in the Nigerian scene, bearing in mind the practical bias incorporated in the national objectives of medical education. In order therefore to ensure the achievement of these objectives and ensure the relevance of the medical school, functionally and developmentally, to the problems of health care of the community, every medical school must be related to a specific population base.

The Teaching Hospital should relate to the local population through the State Health Advisory Committee as scheduled in the *National Health and Strategy to Achieve Health for all Nigerians* (2010 Edition). On this basis, the service, teaching and research

programmes within the medical school organization would remain actively relevant to the health problems and needs of the target population.

Ideally, all institutions within the network should be administered together, but flexibility should permit varying patterns of relationship. The teaching hospital administered separately may work out contractual agreements enabling its team of students and teachers to work within the primary health centres and secondary care general hospitals administered independently of the medical school, *etc.*

Student Intake

The second fundamental data base that should guide the size and development sequence of any medical school is the maximum student population it is expected to hold.

Both criteria together (target population base, and maximum student intake) would determine the size of the medical school with respect to both teaching and service facilities. Availability of resources will of course then determine the rate and sequence of development, starting from the minimal viable beginning to the optimal size.

Assuming that a very large medical academy would train different cadres including doctors, dentists, nurses, pharmacists, laboratory technologists, physiotherapists and public Health personnel of various categories, at the diploma, undergraduate and post-graduate level, the attached scheme (assuming no attrition) gives a maximum student population of approximately 3,400 with 380 in prelim, 2,620 total undergraduate and 350 post-graduate and diploma students as outlined in Table 2:1

Table 2:1

	<i>Prelim</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>Total</i>
<i>Medical</i>	100	150	150	150	150	150	850
<i>Dentistry</i>	20	30	30	30	30	30	170
<i>Nursing</i>	60	80	80	80	80	80	380
<i>Pharmacy</i>	30	50	50	50	50	50	230
<i>Physiotherapy</i>	30	40	40	40	40	40	190
<i>Med. Lab. Tech.</i>	30	50	50	50	50	50	230
<i>Imaging Scientists</i>	30	40	40	40	40	40	190
<i>Public Health</i>	80	100	100	100			380
<i>Postgraduate and Diploma</i>	-	-	-	-			350

Minimum Physical Educational Facilities

As indicated under the discussion of standards, the mere presence of physical facilities is not sufficient to ensure sound training. They must be seen to sub-serve the objectives of medical education, *i.e.* they must be such as to ensure the delivery of the subject matter in the time required to the level desired. Their adequacy must be assessed in relation to the

minimum standards demanded in relation to these aspects of curriculum as well as the relation to the user population of students and patients.

Basic Facilities

1. Student Accommodation

Policy decisions concerning the philosophy underpinning the establishment of an institution of higher learning and the quantum of resources to be devoted toward providing living quarters for students and staff are an important consideration here. However, there is no denying the necessity for students, at certain stages of various clinical clerkships, to be resident within the hospital premises so as to be available to function as part of a caring team round the clock. The following are the prescribed standards:

- (i) All medical and dental students should be accommodated in the University hostel. Not more than two students should share a room for health reasons.
- (ii) There should be provision of hostel accommodation in the hospital for clinical students.

2. Student Transportation

There should be provision of transport to convey the students to their primary health care and other postings.

3. Recreation Facilities

Sporting and recreational facilities should be provided for the students. Active social life should be encouraged through provision of appropriate facilities.

4. Lecture Halls and Tutorial Rooms

There are advantages in organizing teaching in the form of small group discussions and use of simulation techniques, using a fair number of small rooms. It is required that a medical school has:

- (i) A minimum of two lecture halls, each large enough to accommodate an annual intake is mandatory.
- (ii) At least three small discussion rooms (each capable of taking fifteen to twenty students) for each year of the curriculum.
- (iii) One large auditorium, preferably in a hospital site, large enough to take all clinical students (*i.e* annual intake x 3), postgraduate students and clinical teaching staff.

The halls should have audiovisual facilities.

Basic Medical Science Laboratories

For every subject listed, there should be at least 2 (two) square metres of laboratory space provided with worktop and equipment cupboard space for every student. These of course need not be separated for each subject, thus making it possible to maximize the use of facilities by sharing. Where joint use occurs, either on account of lack of funds or because of a deliberate educational policy, the appropriateness of such sharing should be clear. For example, Histochemistry, Histology, Histopathology and Haematology may well share the same laboratory space, with appropriate equipment for each being stored and laid out only when needed for use. Appropriate store and preparation rooms then becomes an essential part of the requirement. It would be inappropriate to use the same laboratory space for

microbiology, gross anatomy and/or human physiology. Each medical school should have its own separate departments for Medical Biochemistry, Human Physiology and Human Anatomy. Registered medical practitioners must be part of the teaching staff complement in each of these departments.

Laboratories

1. Teaching laboratory for students
2. Multipurpose laboratories. This should be specially planned right from the beginning.
3. Service laboratories.

(i) Anatomy and Embryology

This should contain body store, preparation room, prosection room, embalming room, museum, dissection room for 8 – 10 students per cadaver, tutorial room, general store, staff offices, etc. There should also be:

1. Embalmed bodies – 1 cadaver per set of 8 students.
2. Equipment Trolleys.
3. Electric Embalming Machine.
4. Bone cutting equipment – Electric saw/drill
5. Articulated and unarticulated skeletons.
6. X-ray viewing boxes.
7. Models
8. Slides of sections & Slide projectors
9. Information & Communication Technology Equipment [Computers with DVD Drives; CDs & DVDs for the study of the human body – gross & microscopic]
10. Air-conditioning and air extractor fans for the dissecting rooms
11. Changing Room
12. Toilet Facilities,
13. Shower Room etc.

(ii) Histology

There should be an air-conditioned store where consumable material should be kept, preparatory room, teaching laboratory for student, microscope store or under-bench cupboards, wash-up room, work benches with zinc or formica shelves for glass ware, burners etc.

- | | | | |
|--------------------------------|---|---|-------------------|
| 1. Microtome (Rotary/Sledge)– | 2 | | |
| 2. Microtome Knives | | – | 3 |
| 3. Light Microscopes | | – | 1 per 2 students. |
| 4. Vacuum Pump. | | | |
| 5. Dissecting Microtome | | – | 3 |
| 6. Cryostat with Microtome | | – | 1 |

(iii) Animal House

There should be, for all the laboratories, a common and properly maintained animal house with an adequate number of animals.

(iv) Biochemistry

There should be an air-conditioned store where consumable materials should be kept, preparatory room, teaching laboratory for students, etc. There should also be (in the quantities indicated):

- | | | |
|-----------------------------|---|-------------------|
| 1. Centrifuge | - | 6 |
| 2. Ultracentrifuge | - | 2 |
| 3. Electronic Balances | - | 2 |
| 4. Heating Block | - | 8 |
| 5. Vacuum Pumps | - | 2 |
| 6. Spectrophotometer | - | 1 per 20 students |
| 7. pH Meters | - | 1 per 20 students |
| 8. Thermostatic Water Bath. | | |

(v) Physiology

The physiology department should have a small laboratory for animal experiments and a large laboratory for human experiments. There should be an air-conditioned store, a preparatory room, wash room, materials store, etc. The laboratory should, at the minimum, be equipped with a polygraph and the following (in the quantities specified).

- | | | |
|-------------------------------------|---|-------------------|
| 1. Spirometers | - | 1 per 20 students |
| 2. Vitalograph | - | 1 per 20 students |
| 3. Peak flowmeter | - | 1 per 20 students |
| 4. Gas Meter | - | 2 |
| 5. ECG Meter | - | 4 |
| 6. Spectrophotometers | - | 1 per 20 students |
| 7. Physiograph Recorder Transducers | - | 1 per 20 students |
| 8. Oscilloscope | - | 4 |
| 9. Centrifuges | - | 6 |
| 10. Blood Gas Callipers | - | 2 |
| 11. Audiometer | - | 2 |
| 12. Water baths | - | 2 |
| 13. Electronic Weighing balance | - | 2 |
| 14. Flame Photometer | | |
| 15. Microcentrifuge | | |
| 16. Water Distiller | | |

(vi) Research Laboratories

These laboratories should have integrated research facilities and should be multidisciplinary. They should be centrally controlled and supervised by the College, Faculty or School. They should serve as an alternative to separate speciality laboratories where these cannot be provided.

Library and Learning Resources Unit

Library and Reading Space

There should be an air-conditioned separate medical library located in the medical school with at least 5,000 volumes of medical books, and a minimum of 50 current journals covering the various specialties and including local medical publications. Provision should also be made for photocopying services for the students and for inter-library book loan.

A medical library should have designated and functioning sections such as:

1. Reference Books.
2. Periodicals
3. Circulating Textbooks.
4. Library Loan Service, Inter-Library Links and Access to the Internet for Literature Search.
5. Audiovisual Materials based on Current Information & Communications Technology.
6. Back Stack.

It should not be enough to have a reading room with a collection of textbooks, periodical, etc., with no effective library service. When a medical school has multiple hospital bases or a hospital separated from the main teaching areas, the medical library should visibly extend, at least its periodical and library loan service, to every hospital in the complex.

Evidence of subscription to electronic journals and purchase of electronic books should be available. There should be computer terminals through which such electronic learning resources could be accessed by students and staff. There should be an air-conditioned reading facility that could sit a minimum of one class of medical students at a time. Reading facilities may also be provided in other places outside the library, such as departments and laboratories.

Audio Visual Production Unit

The unit should be adequately equipped with hardware and software

(i) Hardware

Software production equipment, public address system, magnetic tapes, tape recorders, multimedia projectors (at least two), video cassette recorder (VCR), cine-camera, overhead projectors, screen etc.

(ii) Software

Each Institution should be able to produce its own software and to acquire commercially available instructional software. It is advisable that the learning resources should be housed together and run as a central unit. However, where this is not possible, every unit could be run on its own.

Teacher Education Unit

This should serve as a special unit for staff training in production of teaching materials, teaching techniques, examination techniques etc.

Administrative Facilities

A minimum provision should consist of:

1. A reasonably spacious suite of offices for the Dean and his staff, including those looking after staff and students welfare, such as Accounts staff, Educational Administration staff, Engineering staff and those looking after the physical facilities and plants.
2. Offices and laboratories for teaching staff related numerically to the minimum staff/student ratio as laid down in the relevant part of this document.

Staff Requirements

There must be at least two full time academic staff of the minimum status of Reader (Associate Professor) and Senior Lecturer in each department and at least one technical

staff for a student population of not more than 30 per class. This is necessary to ensure that the minimum staff on ground will be able to ensure adequate teaching and development of the department. For classes larger than 30 students, there must be one additional academic staff for every 20 additional students and one additional technical staff for every 30 additional students. A minimum of two full time academic staff of at least the status of Reader and Senior Lecturer and one technical staff is mandatory *ab initio*. In addition, there should be a minimum of one full time academic staff with medical or dental qualifications in each of the three departments where the preclinical disciplines of Anatomy, Physiology and Biochemistry are taught. Such staff must be registered with and licensed by the Medical & Dental Council of Nigeria.

By MDCN regulations, all departments are to be headed by appropriately qualified academic staff. In this regard, all clinical departments must be headed by medically-qualified persons who are appropriately registered with, and licensed by, the MDCN. Where non-medically qualified persons are appointed to head clinical departments, the institution risks automatic loss of its accreditation.

Council also requires that the head of a medical training institution, by whatever name called [Provost or Dean or other appellation] shall be a registered and licensed Medical or Dental Practitioner of appropriate seniority. This is because it is to the provost or principal of a medical school that Council delegated the responsibility for the proper training of medical and dental practitioners and such a person must logically be answerable to Council.

Teaching Hospital Facilities

Basic Facilities

Wards:

Basic Requirements

The basic requirements of safe ventilation, easy access, professional medical functions, ward surgical functions, prevention of cross infection, patients, physical comfort and social needs must be provided. Adequate provision must be made for prevention and control of fire incidents by providing appropriate equipment and training. Ward facilities should include nurses' station, sisters' office, doctors' office, side-room laboratory, linen store, splint room (where necessary), treatment room, kitchenette, maximum care facility, patients' day room, clean utility/sterilizing room, dirty utility room, slide room, as well as toilets and shower rooms

Functional Provisions

Adequate lighting, night lighting, circulation space between beds, adequate passage ways and doors, patients' eating facilities visitor reception facilities, patients' movement facilities, wheel chairs and stretchers, medical record trolleys, drug trolleys, drug cupboards, D.D.A. cupboards, dressing trolleys, linen trolleys, medical procedure trolleys and appropriate equipment (*e.g.* for sigmoidoscopy, lumbar puncture, venepuncture, cut down, thoracocentesis, paracentesis, catheterization, wound dressing, percutaneous biopsies, etc.) There should be a minimum of two exit doors in a ward. Provision should also be made for corridors.

There must be separate wards for each of the main specialities: Medicine, Surgery, Obstetrics & Gynaecology and Paediatrics. There must be separate male and female wards in Medicine and Surgery.

The physical structure of the wards must be such as to lend itself to efficient and effective nursing practice, and cleanliness. There should be good ventilation, provision of water, wash hand basins, toilet facilities and mechanisms for effective and sanitary disposal of human waste. There should also be facilities for staff and students – doctors’ room, nurses’ room, and student work-up room.

Theatres

The entries to operating suites must be adequately secluded from general hospital traffic. The patient and staff flow within the suite must be such as to reduce the risk of contamination of the operating rooms and sterile trolleys (*e.g.* a sterile preparation room should serve adjacent operating room[s] only, and not entail transport of sterile surgical trolleys through general traffic zone).

The theatre suite should feature Male and Female staff entrances and changing rooms opening into the “clean area”. The “clean area” of the theatre should feature a circulation corridor having the surgeons’ lounge, nurses’ lounge, theatre coordinating centre, recovery room and the “sterile area”. The “sterile area” should consist of the operating room and its feeder anaesthetic room/corridor, the scrub sink, and the preparation room as well as an exit through a dirty utility area to a service corridor.

A theatre suite with a viewing gallery is desirable,

The patients’ entrance and trolley bay should also open into the clean circulation corridor on the one hand, and the recovery room on the other, for the exit of post operative patients from the theatre area. Functional provisions in theatre should at least include:

- General surgical facilities; facilities for urological and other sub-specialty surgery
- Standard anaesthetic and cardiorespiratory resuscitative equipment and supplies.
- For every operating room in use there should be two recovery beds in the recovery room.
- Constant supply of running tap water, sterile distilled water, anaesthetic gases and drugs, surgical gowns, gloves, shoes, masks, drapes, swabs and suture materials are essential and institutions seeking accreditation should have a demonstrably viable mechanism for ensuring continuity of these supplies.

Staff-Facility and Student-Facility Ratios

The recommended ratio of consultant and students to available hospital facilities, as well as to resident staff are shown in Table 2:2 and 2:3 below:

Table 2:2

Minimum Staffing Requirements in Clinical Departments

Minimum Number of Clinical Departments	Minimum No. of Full-Time Consultants per Department	Minimum No. of Senior Residents per Department	Minimum No. of Junior Residents per Department	Minimum No. of Registrars per Consultant
1. Surgery Including General Surgery, Trauma, Orthopaedics, Ophthalmology, Otorhinolaryngology	5	3	2	2
2. Obstetrics and Gynaecology	3	3	2	1
3. Internal Medicine	3	3	2	1
4. Paediatrics	2	2	2	1
5. Mental Health	1	1	2	1
6. Community Health	2	1	1	1
7. Anaesthesia	1	1	1	1
8. Radiology	1	1	1	1
9. Laboratory Medicine (at least one must be in Histopathology)	2	1	1	1
10. Accidents and Emergencies	1	1	3	3

Table 2:3

Staff/Students-Bed Ratio

Clinical Departments	Minimum No. Of Consultants' Offices	Maximum No. Of Medical Students per Bed	Recommended No. of Beds per Consultant	Maximum No. Of Beds Per Consultant
1. Surgery Including General Surgery, Trauma, Orthopaedics, Ophthalmology, Otorhinolaryngology	3	5	10	20
2. Obstetrics and Gynaecology	2	5	10	20
3. Internal Medicine	2	5	10	20
4. Paediatrics	2	5	10	20
5. Mental Health	1	8	10	15
6. Accidents & Emergencies	1		10 (Observation Beds)	

Out-Patient Services

Each major discipline should have a minimum of 2 clinic sessions per week, and each minor discipline at least 1 clinic session per week.

The maximum number of students that can attend a single clinic session with a minimum of 2 Consultants present is 30 (the learning potentials of an overcrowded clinic is considerably diminished). Adequate space should be made available to the medical students in the outpatient clinics.

Radiological Services

The Radiological Department in a medical school, at the minimum, must be capable of the following diagnostic services:

1. Routine plain radiogram of any part of the body.
2. Routine skeletal films.
3. Gastroenterological contrast studies with screening
4. Genitourinary contrast studies.
5. Simple angiographic studies.
6. Ultrasonography

When there are multiple hospital bases, each hospital must be able to provide these services or Council must be assured of reliable referral services (transport and communication logistics) to bring these services to those units without a full complement of facilities. It would be desirable but ***not mandatory*** to have cine-studies, angiocardiography, tomography and magnetic resonance imaging. The size of the department should be related to the volume of diagnostic services. There should be at least 1 X-ray unit per 100 beds (not counting MX II and portable units).

A Radiation Protection Committee, headed by a radiologist, is a necessary condition for recognition as a teaching hospital.

Pathology Services

Every medical school should provide, at the minimum, the following laboratory services on a routine basis:

Haematology and Blood Transfusion

- Blood transfusion services.
- Simple haematological diagnosis.
- Haemoglobin genotype determination and HIV. Screening.
- G₆-PD determination.

Chemical Pathology

- Serum electrolytes, urea and creatinine estimation,
- Protein Electrophoresis.
- Blood Sugar and Urea,
- Acid and alkaline phosphatase and liver function, tests etc.

Immunology

- Basic serum immunoglobulin determination and complement fixation tests

Medical Microbiology

- Simple smears and staining of all species of bacteria
- Culture, identification and antibiotic sensitivity of all common species of organisms
- Parasitology.

Histopathology

Autopsies

Histopathological diagnosis with routine and special staining techniques

Again, where a medical school has many hospital bases, every hospital must be able to provide these routine services, or Council must be assured of reliable referral logistics to bring these services to the units without a full complement of facilities. In any case, diagnostic tests that are usually required on a 24 hour emergency basis *e.g.* blood typing and crossmatching, sickling test, cerebrospinal fluid studies, haematocrit & white blood cell counts, serum electrolytes, simple smears and staining of microorganisms for microscopy must be provided in every hospital.

Nursing Services

Whether or not it uses the services of student nurses, a teaching hospital must have the following complement of nursing personnel:

1. There should be an adequate number of nurses as would be determined from time to time.
2. Every major clinical department in each hospital, (*i.e.* Surgery, Medicine, Paediatrics, Obstetrics and Gynaecology), should have at least one supervisory staff of Senior Nursing Sister cadre.
3. Whatever its staff complement of nurses or aides, every service area, such as out-patient clinics and theatres, should have at least one senior supervisory nurse or senior nursing sister cadre to establish and maintain an acceptable standard of nursing practice in the area.

Pharmacy Services

Every hospital, be it sole or a component of a complex, must have a Pharmacy department. The staff strength should be a factor of the service load, at least one registered pharmacist per 50 beds. Every hospital pharmacy, must at least have a list of essential drugs (if not a hospital formulary), agreed by clinical staff to be in common use and which therefore must be in constant supply. Council must be satisfied about the logistics for ensuring the constant supply of all essential drugs.

Medical Records Department

Every medical school must have a medical or health records department featuring at least:

1. A reception/registration area.
2. A record audit room.
3. A record completion room, (ideally, but not necessarily, provided with dictating machines).
4. A pool of record clerks and typist.
5. A medical records library.
6. One trained medical records officer.
7. Computerization of the department.

Irrespective of how many hospital bases a medical school has, each one must have facilities listed 1 to 5 above.

Catering Services

A catering service providing for both the patients as well as students and staff must be part of the minimum features of any teaching hospital, be it sole or part of a complex.

Social Welfare Service

An active medical and psychiatric social welfare service must be present both for teaching and, especially, for service in any teaching hospital. The staff complement must be a function of the service load. There should be one medical social worker for every 100 hospital beds (ideally, it should be a factor of the population being served).

Hospital Laundry

An efficient linen and laundry service is required. It is possible for this to be provided on contract by private organization. Council must be satisfied that function is ensured, whatever the logistics.

Central Purchasing and Supplies Unit

Ample storage space and an effective logistic support for purchasing and supply of equipments, drugs and supplies must be in evidence.

Central Sterile Supply Department (CSSD)

Full CSSD facilities should be provided to ensure that supplies for surgical procedures are readily available.

Accidents and Emergencies Unit

Every teaching hospital, whether sole or part of a complex, must have an adequate and effective accidents and emergencies unit featuring:

1. Reception/Registration area.
2. Ample Triage Room.
3. Treatment Rooms – equipped with treatment coaches.
4. A minor operating theatre.
5. A fracture-setting room (ideally with an adjoining X-ray unit).
6. A resuscitation room.
7. A recovery Room.
8. Emergency drugs stocks.
9. Ambulance service. Ambulances must be fully equipped and distinct from other forms of transportation and hearse services.

Such a unit must also have demonstrable logistic support for providing 24 hour coverage.

Primary Health Care Facilities

In Nigeria, post 1975, every medical school accepts and contributes to the national concept of Basic Health Services founded on primary health care. Every medical school must therefore, adopt at least one local government area or, better still its population base, and

supervise and coordinate its primary health service facilities, using such facilities as physical training centres for the schools.

The hospital general out-patients department should no longer serve this purpose but should instead be the nexus for training in Family Medicine.

Dental Facilities

The specific additional requirements for the training of dental surgeons are stated in *Part Three* of this book of guidelines

Length of Instruction

Council requires a minimum of 18 calendar months of instruction, excluding periods for holidays, for the completion of Basic Medical Sciences course. Where an institution has been approved by Council to offer the four-year post-baccalaureate programme, the Basic Medical Sciences course should cover a minimum period of 45 weeks, excluding periods for holidays.

Council requires a combined minimum of 145 weeks of instruction in the basic clinical sciences and clinical postings for the completion of clinical training, excluding periods for holidays.

CHAPTER 3

NATIONAL OBJECTIVES OF MEDICAL EDUCATION

It is important to emphasize the fact that the broad objectives of medical education vary from country to country, and certainly between the developed and the developing countries of the world.

The overall objectives of medical education in any country will depend on the answer to the basic question. "What is the role expected of the doctor after graduation?" "Will he be a general practitioner, a future research worker, a future teacher, a future specialist, or all of these?" The answer will depend on many variables such as the needs of the country, its resources, its medical geography etc. In Europe and North America for instance, where the doctor/population ratio is high and specialization in one branch or another forms the main pivot for professional practice, the nature and amount of professional responsibility of the doctor at graduation differs significantly from that in African countries or in any developing country with similar health problems. However, the objectives of medical education in the various countries of the world can be classified into two broad categories.

- (a) The first category is concerned with the preparation of persons for practical professional functions after graduation from the medical school.
- (b) The second category is aimed mainly at the establishment of a scientific foundation, sufficient for understanding the principles of medical practice, as well as for the acquisition of new knowledge through meaningful postgraduate studies and active research.

Both elements are present in practically all patterns of medical education but in different proportions and with different degrees of emphasis. Urgent needs of a social nature sometimes result in putting the greater emphasis on the practical preparation of the student, but there is also a universal acceptance of the need for the solid scientific basis even in less developed countries which do not want to compromise on the scientific quality of the doctor.

The realities of the Nigerian situation are that almost immediately after graduation, the Nigerian doctor is required to assume professional responsibilities far in excess of those which his/her counterpart in the more developed countries would be expected to carry.

Nigeria has the largest population in Africa. It has a very high rate of population growth, a low doctor – population ratio, and relatively low income *per capita*. The vast majority of the people are illiterate, and live in rural areas. These facts notwithstanding, the Federal Government has committed itself to a policy of making primary health care available to the entire population. Consequently, it is necessary to reflect these realities in our national philosophy and objectives of medical education, and to take them fully into account in the formulation of minimum standards in our medical training programmes. The aim of medical education in Nigeria must be to develop a careful balance between the two categories of objectives stated above, emphasizing clear and unmistakable responsibilities which the doctor will be expected to assume soon after graduation. This, therefore, must be the national goal in medical education. It is not good enough in our circumstance for a medical

school to train medical and dental practitioners only, without reference to the need for supporting staff, such as laboratory scientists, radiographers (imaging scientists), public health inspectors, nutritionists & dieticians, health educators, *etc.*

The specific objectives of medical and dental education in Nigeria should be:

- (a) To provide a sound scientific and professional basis for the training of medical and dental practitioners capable of working anywhere in Nigeria with other health workers.
- (b) To provide such training as would equip these health personnel to render Primary Health Care (PHC). Teaching of primary health care should be multi-disciplinary, involving all clinical departments.
- (c) To produce medical and dental practitioners who are conversant with Nigeria's National health policies and global health issues.
- (d) To produce medical and dental practitioners whose training is community based. In keeping with the concept of social responsibility all health training institutions should make a definite commitment to provide community service.
- (e) To produce medical and dental practitioners who would satisfy internationally recognized standards, and who could undertake further training towards specialization anywhere in the world.
- (f) To produce medical and dental practitioners with sufficient managerial ability to play a leadership role in health care delivery.

PART TWO

MINIMUM STANDARDS FOR MEDICAL EDUCATION

CHAPTER 4

ACCREDITATION AND MONITORING PROGRAMME

Having laid down the guidelines on minimum standards, and mindful of the prophylactic rather than judgmental role it must play, Council has stipulated the following yardsticks, sequences and procedures for assessing compliance with these established guideline in the operation of medical schools in Nigeria.

Time Table of Assessment/Schedule of Visitation

This should best be conceived as the timetable of the prophylactic involvement of Council in the development of medical schools.

Step I

Once the proposal to establish a College of Medicine in a University is formalized, the Vice Chancellor should communicate this proposal to the Medical and Dental Council at the same time as to the National University Commission (NUC) and the Directorate of Planning of the Federal Ministry of Health.

Step II

The Registrar of the Council sends the copy of Council's *Guidelines on Minimum Standards of Medical and Dental Education in Nigeria* (this document) to the Vice Chancellor and at the same time initiates consultation with the National Universities Commission and the Directorate of Planning at the Federal Ministry of Health.

Step III

There is a continuation of detailed planning operations by the University, in concert with the Medical and Dental Council of Nigeria, the National Universities Commission and the Federal Ministry of Health, in coordination with the national planning machinery.

Step IV

In the light of developments in Step III above, the Registrar of Council arranges the visitation time table for the Medical Education Committee of Council, in consultation with the Provost or Dean of the medical school concerned, and according to the following sequence:

1st Visitation

Before the first set of students are admitted for pre-clinical course - usually called 'Advisory Visitation'.

2nd Visitation

During the first year, before writing first professional examinations in Anatomy, Physiology, Medical Biochemistry and other subjects like Genetics, Medical Psychology, Public Health Science, Medical Sociology and Biostatistics

3rd Visitation

During the third year (the second year in the 4-year post baccalaureate programme if that is what Council approved for the school), before the second professional examination in

Pharmacology and the Sciences of Pathology; the visit will also evaluate the facilities for clinical training for the next stage of the visitation which is after writing the second professional examination.

4th Visitation

Before writing the final professional examinations in Obstetrics & Gynaecology, Paediatrics, Psychiatry, Medicine, Surgery and Community Medicine & Primary Care in the 4th or 5th year of training

Subsequent Visitation

There will be a **Re-Accreditation** visitation to any accredited medical school every five (5) years after the 4th visitation. Council may also arrange a visitation to an institution when there is good reason for doing so, such as infringement of the minimum standards. Where defects have been identified that require corrective action within a specified period of time on the part of the institution, a **Verification** visitation may be undertaken to ensure that such defects have been corrected.

Special Notes on Accreditation Visitation

Any accredited institution which wilfully foils a scheduled visitation by Council and fails to accept visitation within ninety days of the date previously given by Council, shall automatically lose its accreditation status. Therefore, whenever dates of accreditation visitation proposed by Council are not suitable for the authorities of any institution, the members must proffer a new date acceptable to Council within the above time limit. Should they fail to do this, the institution would stand discredited.

The accreditation of any new medical school would be effective from the date accreditation is granted by Council, and not from the date such a school decided to be admitting students without due accreditation.

Procedure of Accreditation:

The process of each visitation should feature:

1. The completion of specific questionnaires seeking information on the state of the institution in respect of the specific criteria outlined in these minimum standards.
2. Inspection of the facilities in the school.
3. Interviews with the staff
4. Interviews with students, at the discretion of the visitation panel.

The completed questionnaires and a summary of the findings would then be presented to Council (through the Medical Education Committee) after each visitation to enable Council decide on the accreditation status of the institution.

Full accreditation shall be granted to any medical school that has satisfied the Guideline on Minimum Standards of Medical & Dental Education in Nigeria and such accreditation shall be valid for a period of five (5) years after which there shall be a visitation for reaccreditation.

On the other hand, any medical school which fails to achieve the standards stipulated in the guidelines on minimum standards of medical education in Nigeria shall remain unaccredited and may be considered for accreditation only when the school authorities have formally requested for Council's re-visitation and the re-visitation panel makes favourable recommendations acceptable to Council.

Council Observers

There should be a Council Observer at each professional examination until the first set of students graduate. Also once every five (5) years, after graduating the 1st set of students, each professional examination should be attended by a Council Observer.

CHAPTER 5

THE MEDICAL CURRICULUM

It should be made clear that the development of the curriculum of a school of medicine is the responsibility of the Faculty of the Medical School and Senate of the University/Institution. The Medical and Dental Council of Nigeria has noted that the National Universities Commission has now provided guidelines on approved minimum academic standards in this respect. Council will continue to work with the NUC in ensuring harmonization of the standards required for the training of medical and dental practitioners by both bodies. The role of Council is to satisfy itself that the knowledge, skills and attitudes derived from a curriculum meet the standards required by the Council from those seeking to be recognized by the Council as members of the medical profession, and to give clear indications of the yardsticks by which such standards are measured. These yardsticks, in the Nigerian context, must be based on the expected terminal behavioural characteristics of the graduate as stated in the *National Objectives* enunciated above.

The role of the Nigerian medical school in curriculum development in these circumstances, therefore, is to work backwards from the above role definition, and to design programmes that will lead the student to the stated terminal objectives. Such programmes can then be separated into components as COURSES, and the courses in turn sub-divided into UNITS of instruction requiring a number of sessions, the duration of which must be clearly defined.

As already stated, it is not the intention of the Medical Council to impose a curriculum on any medical school in Nigeria, recognizing clearly not only the right of these Institutions to pursue academic excellence, but also the need for them to develop innovative approaches in matters relating to curriculum development. Council must however, be satisfied that the curriculum is such as to adequately prepare the students of the institution for the practice of medicine in Nigeria. It is to ensure this that Council lays down guidelines in the following specific areas:

1. The subject matter which the curriculum must cover.
2. The minimum length of time the students must spend in the undergraduate (or approved post-baccalaureate) training programmes
3. The facilities and resources – physical, manpower, equipment and supporting services which must be such as to ensure the delivery of the subject matter in the time required, to the level desired.

Selection of Students

Theoretically, the education curriculum is designed on the basis of the terminal behavioural objectives of the programme, which in turn is based on the roles and tasks that must be performed by the graduates of the programme in the job situation. Having set these benchmarks, the minimum level of general education that a prospective student must possess in order to benefit optimally from the curriculum is determined. In practice, more often than not, the decision on the minimum level of general education required of students wishing to enter medical schools is not optimally related to the medical school curriculum, but to the general format of secondary school education in the country. The following

secondary school subjects are deemed prerequisite to medical education: *Biology: Physics: Chemistry: Mathematics and English.*

Prospective medical students must pass the West African School Certificate or the Senior Secondary School Certificate Examination or any equivalent examination, with at least Credit level passes in the above five subjects.

Admission Requirements

For admission into undergraduate medical education programmes, the candidates must, in addition to fulfilling the criteria stated above, be successful in the Unified Tertiary Matriculation Examination (UTME) or obtain three principal passes in Biology, Chemistry and either Physics or mathematics at the General Certificate of Education Advanced Level Examinations.

For admission into approved post baccalaureate 4-year programmes, applicants must obtain a university degree not below 2nd class lower division in the biomedical, biological, chemical or physical sciences, provided such a course of study included specific courses as may be listed in the *Guidelines on Minimum Standards of Medical and Dental Education in Nigeria* ('the Red Book') and other publications of Council from time to time. Only candidates who had credits at SSSC level in English, Mathematics, Physics, Chemistry and Biology would be eligible. The candidates must have offered and passed courses at undergraduate level in the following:

Physics including Mechanics, Thermodynamics, Optics, Basic Principles of Electromagnetism

Chemistry including Physical Chemistry, Organic Chemistry, Inorganic Chemistry and Chemical thermodynamics

Biological or Life Sciences including General Mammalian Anatomy and Physiology (Human or Animal) covering the Musculoskeletal, Haemopoietic & Haemostatic, Immunological, Neurological, Cardiovascular, Renal, Endocrine and Gastrointestinal Systems); Psychology (Human Psychology and Basic Human Behaviour); General Biochemistry (including protein chemistry and the chemistry of other biomolecules, cellular metabolism and molecular biology); at least one of a selection of courses in Microbiology, Genetics, Molecular Genetics/Biology, Neuroscience, Nutritional Sciences, Pharmacology, Toxicology, Botany, Biology or Zoology.

The selection of the students should take into consideration the academic performance of candidates *vis-à-vis* the requirements of future medical practitioners. Interviews are strongly recommended in the selection of candidates to the medical school in order to determine each candidate's aptitude and suitability.

The nomenclature for the degree programme in Medicine shall be specified by the institution either as a Bachelor of Medicine & Bachelor of Surgery or, for institutions with approval from Council to run four-year post-baccalaureate programmes, Doctor of Medicine.

Curriculum Planning

The planning and evaluation should be designed in such a way that there should be clear-cut objectives which must be evident and should be evaluated from time to time.

Course Unit System

Examination by Course Unit System is not considered feasible under the present condition and so should not be made compulsory. This book of guidelines does not encourage the use of the credit unit system.

CHAPTER 6

SUBJECT MATTER, CURRICULUM AND COURSE CONTENT

Council recognizes that the curriculum of a medical school is normally designed and produced by its Faculty, subject to the approval of the appropriate University organ such as the University Senate. These guidelines set out the minimum standards to be met for accreditation by Council.

Some medical schools follow the traditional pattern of arranging their subjects under Pre-Clinical and Clinical programmes with definite time allotments to each area, the latter taking at least 36 months. Some others tend to follow an integrated pattern in which there is a definite overlap between the two and students may begin to be exposed to the clinical area from their first year. Whatever approach is taken, Clinical Governance, Quality & Safety in Health (CGQS), which incorporates such topics as health management, forensic medicine, evidence-based practice, ethics and jurisprudence, must be integrated into the curriculum right from the first year of professional training. This may be part of the Community Health and Management or the Family Medicine portion of the curriculum or it could be based in another department.

Council encourages an integrated approach to teaching both in the pre-clinical and clinical aspects of training. In the pre-clinical years, schools are encouraged to teach the Anatomy, Histology, Embryology, Physiology and, where necessary, the Biochemistry of individual body organs or organ systems contemporaneously. During the clinical postings, teachers of the basic clinical sciences should be invited by the clinical departments to come and teach the aspects of the basic clinical sciences that are relevant to the clinical postings being undertaken by the students.

The Medical and Dental Council of Nigeria recognizes that there is a clear distinction between the **Basic Medical Sciences**, **Basic Clinical Sciences** and the **Core Clinical Sciences** and prefers to specify the disciplines which must be included in the basic sciences curriculum of an approved medical school as follows:

Basic Medical Sciences

Human Biology (including Anatomy, Histology, Physiology, Biochemistry, Genetics), Medical Sociology, Psychology and Statistics

Basic Clinical Sciences

Medical Biology which includes Pathology; Morbid Anatomy or Histopathology, Microbiology and Immunology, Haematology, Chemical Pathology, Epidemiology, Biostatistics including computer appreciation, Medical Informatics and Environmental Health.

General Objectives

The courses in the Basic Medical Sciences should be structured in a way that will enable all the relevant materials to be taught within a period of 18 calendar months in the traditional undergraduate medical programme and within 48 weeks in the 4-year post baccalaureate

programme, where approved by Council. As much as possible, specific organ systems should be taught contemporaneously, *e.g.* cardiovascular anatomy should be taught at the same time as cardiac and vascular histology, embryology and physiology of the circulatory system.

1. Anatomy

The anatomy curriculum includes the following:

1. General Anatomy
2. Regional/Gross Anatomy
3. Microscopic Anatomy/Histology
4. Developmental Anatomy/Embryology
5. Genetics

Throughout, the course structure must be related to function. The course of Gross Anatomy should be taught synchronously with Embryology and Histology in order to emphasize the morphological and functional integrity of the body as a whole. Appropriate clinical correlation will be emphasized to form the basis of clinical procedures in the practice of medicine. Understanding normal structure and function must be to permit recognition of disturbances in such function as well as understanding of the developmental process of such disturbances.

General Anatomy

Anatomical position, terminology of anatomy in particular and medicine in general; study of skin, fascia, bones, joints, muscles, nerves and blood vessels.

Regional/Gross Anatomy

Including the study of:

1. Upper limb
2. Thorax.
3. Abdomen, Pelvis/Perineum.
4. Lower Limb.
5. Neuroanatomy
6. Head, Face and Neck

The students will be taught 'Living Anatomy' as an introduction to physical examination. Emphasis will be placed on dissection of the cadaver, study of osteology, kinesiology, position, extent and functional integrity of organs and systems, and the anatomical basis of clinical problems where such exists.

Microscopic Anatomy/Histology

1. *General Histology*

Cell structure and function, basic tissues of the body – epithelium, connective tissue (including specialized connective tissue of cartilage, bone & blood), muscle and neural tissues

2. *Systemic Histology*

Structure and function of the following systems:

1. Cardiovascular.
2. Respiratory.
3. Digestive
4. Urinary.
5. Female Genitalia.
6. Male Genitalia
8. Lymphoid
9. Skin and its appendages.
10. Endocrine
11. Special Senses
12. Nervous

Emphasis must be placed on the relationship between function and structure. Practical classes should include demonstration slides and slides to be handled by students individually. Not more than two students should share one microscope.

Embryology/Developmental Anatomy

1. *General Embryology*

- Sperm, ovum, gametogenesis, division (mitotic and meiosis), fertilization
- Pre-embryonic period – Week 1, 2, 3
- Embryonic period – Weeks 4 to 8; Folding of Embryo, Development of Systems, Development of the Placenta and Fetal Membranes
- Fetal period – Weeks 9 to 40
- Factors affecting normal embryogenesis – nutritional, endocrinal, pharmacological, infectious, occupational, climatic and intrinsic factors; twinning, anaemia, etc

2. *Systemic Embryology*

Development and congenital abnormalities of the following systems, including an explanation of the genesis of congenital abnormalities:

- Musculo-skeletal – including ossification
- Cardiovascular
- Respiratory
- Digestive
- Genito-urinary-both male and female
- Bronchial/Pharyngeal apparatus and its derivatives: face, tongue, palate, thyroid gland.
- Nervous system and Endocrine glands
- Special areas of development – twinning, teratogenesis

Lectures in embryology should normally coincide with the gross anatomy programmes of that system and should be supplemented by practical demonstration of models, slides and soft parts. *Advantage should be taken of advances in digital imaging and the use of information and Communication Technology [DVD Drives, CDs and DVDs] as well as internet access for instruction of students in these subjects*

Genetics

- Structure of Nucleus, DNA.

- Chromosomes, structure, number, aberration, genes
- Division – mitotic and meiotic
- Inheritance – Mendel's laws
- Common genetic problems, due to change in number and structure of chromosomes, autosomal dominant, autosomal recessive, X-linked and Y-linked inheritance, polygenic inheritance, gene polymorphisms *etc*
- Basic Genetic Counselling: premarital counselling in sickle cell disease; counselling of elderly parents *etc*

2. Biochemistry

General

- Chemistry of biomolecules; classification and structure of proteins and amino-acids, nucleoside, nucleotides and nucleic acids.
- Enzymes, Elementary Enzymology and Bioenergetics; Vitamins and Coenzymes
- Metabolism of Biomolecules; Metabolic Interrelationships and implications for health; Inborn Errors of Metabolism

Applied Biochemistry (Special Topics)

- Biochemistry of hormones and special organs and tissues; Neurochemistry, Biochemistry of muscle contraction
- Body fluids, blood clotting mechanisms; Haemo-proteins (haemoglobin, myoglobin and cytochromes), haemoglobin metabolism
- Biomembranes, basic knowledge of membrane structure and function
- Introductory molecular biology: terminology, basic concepts and tools, basic biochemical genetics, genetic code, protein synthesis and regulation of gene expression, polymerase chain reaction (PCR); Recombinant DNA Technology and its medical applications;
- Molecular and biochemical basis of inheritance
- Chromosomal aberrations
- Common genetic problems and their modes of inheritance (haemoglobinopathies, sickle cell disease *etc*)
- Gene replacement therapy and diagnosis of genetic diseases
- Genetic engineering - basic concepts
- Detoxification mechanisms, metabolism of foreign compounds (xenobiotics), forensic biochemistry
- Immunochemistry: basic concepts of immunology and applications.
- Nutrition: principles of human nutrition, food and dietetics, biochemical basis of nutritional diseases and remedies, mineral and vitamin metabolism.

Practicals

- Acid-base chemistry pH and buffers; qualitative analysis of biomolecules: carbohydrates, protein, lipids and nucleic acids
- Enzymology practical, Km and Vmax determination and application, factors affecting enzyme activity including inhibitors

- Simple metabolic experiments, glucose tolerance test, diagnostic enzymes determination e.g. SGOT, SGPT etc, body fluids chemistry/analysis
- Nutrition Project: e.g. nutrient deficiency state experiment using animal model or mimicking a particular disease state in blood/urine and detection.

3. Physiology

Aims

The course is designed to give an introduction to the physiological principles governing normal function of the human body and to indicate the objectives of studying the subject. Thus the factors, which determine the organization and integrative action of the systems of the body will be analysed and discussed.

The Objectives of the Course are:

- To indicate the core physiology knowledge upon which medical practice is based
- To indicate the experimental basis of this knowledge
- To relate basic knowledge to an understanding of common abnormalities
- To use this basic knowledge to explain common pathological disturbances, especially failure of certain functions
- To use the description of these disturbances to reinforce basic knowledge.
- To encourage the student to think of disease in terms of disturbed functions.

Curriculum Content

- Introduction to Physiology
- General Principles of Physiology, cell physiology, cell membrane transport mechanisms, Homeostasis.
- Blood and Body Fluids; fluid compartments, composition of blood, RBC, WBC, Platelets, haemostasis, blood groups, body defence and immunity
- Respiratory System: organisation, mechanics of breathing, transport of respiratory gases, pulmonary functions, hypoxia, special environments, control of respiration.
- Cardiovascular System: organisation, cardiac muscle, cardiac cycle, electrical and mechanical events, ECG, cardiac output, arterial pressure, peripheral resistance, circulation in special regions (Heart, Brain, Skin); control of cardiovascular functions
- Gastrointestinal Tract and Nutrition: organisation of GI system, motor functions, digestion, absorption, accessory organs, (salivary, pancreas, liver, gall bladder).
- Normal diets – composition, metabolism, BMR, malnutrition, human milk, infant diet and weaning diet.
- Renal System: general plan, clearance, urine formation, composition of urine, osmolarity & osmolality, fluid and electrolyte balance, acid-base balance.
- Endocrinology: principal organs, control mechanisms actions, neuro-endocrines (hypothalamus), pituitary, adrenals, pancreas, gonadal hormones, other hormones
- Reproduction: developmental stages (Puberty etc), male and female reproductive systems and functions, ovarian cycles, pregnancy, parturition, contraception
- Neuro-locomotor: excitable tissues, membranes, biologic potentials (action potentials, etc) neurons, synapses, neurotransmitters, muscles, divisions of the nervous systems, receptors, reflexes, functions of spinal cord, brain stem, cerebellum, basal ganglia and

cerebrum, control of posture and movement; EEG, sleep, conditioned reflexes, higher functions of the cerebrum, special senses (especially vision, hearing *etc*)

4. Introductory Community Medicine

Sociology

- Patient-Doctor Relationship
- Communication – signals and problems.
- Population Structure, Growth Policy
- Illness and Good Health
- Attitude to disease in the community
- Marriage
- The family, and its influence on illness
- Factors affecting the morale of the community
- Urbanisation and economic factors
- Alcohol, Tobacco and Drugs
- Alternative medicine

Environmental Health

- Man and his environment; Environmental sanitation

Vital Statistics and Statistical Methods

- Data Collection: Records, Surveys *etc*.
- Methods of computation and analysis of numerical data
- Summarisation and presentation of data
- Data Interpretation

Public Health Administration

- History of Health Services Administration
- Concepts, Principle and Functions of Management
- Comparative Analysis of Health Care System in Different Countries
- Political Commitment to Health Policy and Administration

Organisation and Management of Health Services in Nigeria

- Management of Human, Material and Financial Resources
- Pattern of Health resources distribution
- The Economics of Health Care
- The Health Planning Process
- Evaluation of Health Services: Health Information System
- Evaluation Indicators

5. Medical Psychology

Course Objectives

The Course should be taught with the basic medical sciences in the first or second year of study.

At the end of the course, the student should be able to:

- State the role of psychological factors in general medical practice
- Identify and differentiate between various fields and schools of thought in Psychology
- Name the components of behaviour.
- Identify and describe the mechanisms implicit in the following cognitive processes:
 - Learning.
 - Perception.
 - Thinking.
 - Memory.
 - Intelligence.
- Describe personality in terms of 'Traits' and 'Types'
- Discuss the Dynamics of Personality.
- Identify the determinants of personality.
- Describe and differentiate the various theories of personality development.
- Identify the ways in which culture, environment and personality are related.
- Define ('and differentiate between various types of groups: and identify the dynamic factors implicit in these types.
- Name the different types of variable used in behavioural research.
- Identify the different types of variable used in behavioural research.
- Differentiate between descriptive and inferential statistics and identify the functions of each in the context of behavioural research.
- 'Attitudes' 'Opinions' and 'Prejudice'
- Describe Design and carry out a simple study, including collection and analysis of data.
- State features that distinguish 'normality' from 'abnormality'.
- Identify and describe basic psychopathological mechanisms, such as frustration, conflict and anxiety.
- State the role of Ego defence mechanisms in the context of normal and abnormal patterns of behaviour.
- Name the major types of psychopathological conditions.
- Briefly describe major features of each type of psychopathological condition

Course Content

- Introduction to Psychology: Definition and History of Psychology.
- Relationship of Psychology to Medical practice.
- Field of Psychology: An introductory orientation to various fields and specialities of Psychology - clinical, educational, organisational *etc.* Pure and Applied Psychology.
- Schools of thought in Psychology: Introductory orientation to major theoretical approaches to Psychology, viz: Structuralism, Functionalism, Psychoanalysis, Gestalt Psychology, Behaviourism and Humanistic/Existential Psychology.
- Psychology as a science.
- Behaviour: Cognitive/Affective aspects.
- Stimulus – Response paradigm.
- Systems approach to behaviour.
- Motivation: various theoretical approaches ranging from 'Drive" to 'Self Actualization'.

- Moods, Emotions and Feelings, and their relationship to behaviour.
- Learning: S-R and Insight oriented approaches; Problem solving.
- Memory: Neuro-chemical and Psychological approaches.
- Perception: mechanisms - normal and deviant; modes of perception: illusions: Extrinsic/Intrinsic factors affecting perception.
- Thinking: definition; dimensions of thinking; convergent-divergent; lateral-vertical:
- Cognitive Styles.
- Intelligence: Definition; Intelligence Quotient; Structure of intelligence (factorial model): Assessment of Intelligence.
- Cognitive development: theories of Jean Piaget.
- Creativity: Definition: aptitudinal and non aptitudinal aspect of creativity.
- Definition and Description of Personality; dynamics of personality; determinant relative contribution of heredity and environment.
- Personality development: Theories of Freud, Erickson, Bowlby, *etc.*
- Introduction to Social Psychology.
- Culture, Environment and Personality.
- Psychology of attitudes, opinions and prejudices.
- Social Psychology of groups; group dynamics; types of groups.
- Introduction of Behavioural Research; introduction to research design, sampling, data collection data, analysis; types of research: types of variable: experimental and non-experimental research.
- Use of Statistics in Behavioural Research: Descriptive and Inferential Statistics
- Fundamentals of Psychopathology.
- Normality and Abnormality.
- Basic Mechanisms: Frustration, Conflict and Anxiety.
- Psychic Apparatus & Defence Mechanisms: their Normal and Pathological Manifestations.

The Clinical Sciences

Medicine, Surgery, Obstetrics & Gynaecology, Paediatrics, Mental Health, Community Health (Public Health), Dentistry and Oral Surgery, Radiography, Dermatology, Pharmacology and Therapeutics, Otorhinolaryngology (ENT), Ophthalmology, Orthopaedics, Anaesthesiology, General Medical Practice, Medical Jurisprudence, Principles and Practice of Management, Communication Arts (Educational Methods and Technology) and Medical Ethics.

The periods recommended for instruction in each of these disciplines are outlined in Table 6:1 below:

Table 6:1

Periods of Instruction Recommended for the Clinical Sciences

Morbid Anatomy	7 weeks
Haematology	3 weeks

Microbiology	7 weeks
Chemical Pathology	4 weeks
Community Health & Primary Health care	14 weeks
Pharmacology and Therapeutics	7 weeks
Introductory Medicine	8 weeks
Introductory Surgery	8 weeks
Paediatrics	16 weeks
Obstetrics & Gynaecology	16 weeks
Family Medicine	2 week
Radiology	2 weeks
Anaesthesia	4 weeks
Psychiatry	4 weeks
Ophthalmology	2 weeks
Otorhinolaryngology	2 weeks
Medicine	12 weeks
Surgery	12 weeks
Electives	4 weeks
Other Rotations (at Institutional Discretion)	9 weeks
TOTAL	145 weeks

1. Medicine (Internal Medicine, including Dermatology)

Introduction

The course in Medicine is strenuous and the syllabus is as wide as the diseases afflicting man. However, in the interest of orderly progression of the learning process, it is best to divide it into distinct stages which allow the student time to assimilate and consolidate his newly acquired knowledge and skills before progressing to the next stage.

Course Outline

1. Introduction to Clinical Medicine - 1 week
2. Junior Clerkship - 7 weeks
3. Intermediate Clerkship - 8 weeks
4. Senior Clerkship - 4 weeks

1.0 Introduction to Clinical Medicine

1.1 Objectives:

At the end of this course, the student should be aware of the ideal composition of the health care team and should understand the roles and responsibilities of the various members of the team, understand the relationship that should exist between doctors and the different cadres of the health care team, be able to relate positively to members of the health care team in the best interest of patients, understand the basic ethical requirements in his dealings with patients and in the doctor-patient relationship.

1.2 Content

Introduction to occupational therapy, medical social work, laundry, mortuary, diagnostic laboratories and radio-diagnosis

2.0 *Junior Clerkship*

2.1 Objectives

At the end of the course, the student should be able to:

- Obtain a full and relevant clinical history from any patient.
- Record and present the history to medical colleagues in a professional manner.
- Carry out a complete physical examination on any patient.
- Identify abnormal symptoms and signs in the patient.
- Examine and identify abnormalities in the patient's urine specimen.
- Perform venepuncture to obtain blood specimen
- Give safe intramuscular injections
- Carry out a naked eye examination of a patient's sputum and stool specimens and identify and comment appropriately on any discernible abnormalities.
- Take a patient's temperature (oral, rectal and axillary; and understand the advantages and limitations of each).

2.2 Teaching and Learning Methods

- Lectures and discussions
- Practical demonstrations
- Practical exercises on allotted patients
- Use of self instructional materials – textbooks and audiovisual aids

2.3. Evaluation

- Written Paper
- Clinical Skills Assessment

3.0. *Intermediate Clerkship*

3.1 Objectives

At the end of the course, the student should be able to

- Clerk patients fully on his/her own and make a list of the likely diagnoses and differential diagnoses based on his findings: request appropriate investigations to confirm or support the likely diagnosis or exclude differential diagnoses: describe appropriate management of the patient.
- Understand the basic principles and uses of modern methods of diagnostic imaging.
- Identify common abnormalities in radiographs of the chest abdomen, bones, gastrointestinal and urinary tracts.
- Understand the indications for and, on his/her own, record an electrocardiograph on any patient.
- Identify common abnormalities on ECG and list their clinical significance.
- Understand the indications for aspiration of, and safely aspirate pleural effusions and ascites
- Examine specimens of body fluid aspirates, such as CSF, pleural and peritoneal effusions and be able to interpret correctly the result of laboratory investigations on the specimens.
- Explain the clinical manifestations of diseases on the basis of the underlying pathophysiology of the lesions.

- Understand the principles of writing medical prescriptions and be able to write prescriptions for common manifestations of disease, such as pain, fever, nausea, vomiting, diarrhoea, constipation and insomnia.
- Understand the use of chemotherapy and chemoprophylaxis to combat infections caused by bacteria, plasmodia, viruses and mycoplasma.

3.2 Teaching and Learning Methods

- Lectures and seminars
- Tutorials
- Constant practice on allotted patients
- Participation at ward and Grand Rounds
- Use of self instructional materials – textbooks and audiovisual aids

3.3 Evaluation

- Written paper (MCQ and Essay) and Clinical Skills Assessment

4.0 *Senior Clerkship*

4.1 Objectives

At the end of the course, the student should be:

- able to carry out all the objectives of the junior and intermediate postings proficiently and with greater confidence
- able to receive and manage appropriately medical emergency cases involving any body system including coma, hyperpyrexia, cerebral seizures, shock, sickle cell crises, ischaemic heart disease, pulmonary embolism, pneumothorax, bleeding disorder, acute thrombosis, hypertension, myocardial infarction, cardiac failure, massive haemorrhage, severe anaemia, fulminating infection, tetanus, anaphylaxis and erythroderma
- able to conduct cardiopulmonary resuscitation proficiently
- able to fully understand the diagnosis, prevention, treatment and prognosis of locally important endemic diseases
- able to clinically diagnose and manage patients with malignant diseases, including their referral for appropriate specialized treatment, and understand principles of palliative care
- fully conversant with the principles of ethical medical practice
- aware of the role of medical practitioners in the society and their responsibility in promoting and maintaining the good health of the populace at all times
- able to diagnose psychosomatic and psychiatric diseases and treat or refer as appropriate
- well aware of the role of research as a tool for continuing improvement in health care delivery

4.2 Teaching and Learning Methods

- Lectures and seminars
- Tutorials
- Constant practice on allotted patients
- Participation at ward and Grand Rounds

- Use of self instructional materials – textbooks and audiovisual aids

4.3 Evaluation

- Written paper (MCQ and Essay) and Clinical Skills Assessment, including oral examination

Course Content

Areas to be covered include pathology, pathogenesis, aetiology, clinical manifestations, natural history, treatment and prognosis.

General

Fever, Pain, Coma, Acute Poisoning, Anaphylaxis

Cardiology

Rheumatic Fever; Rheumatic Heart Disease, Infective Endocarditis, Ishaemic Heart Disease, Hypertension, Dysrrhythmias and Cardiac Arrest, Pericarditis, Cardiomyopathy, Heart Failure, Investigation of Cardiovascular Disease

Dermatology

Parasitic and Viral Skin Infections, Filariases and Guineaworm Disease, Eczema/Dermatitis, Pruritus, Leprosy and other Granulomata, Drug Eruptions, Pigmentary Disorders, Skin Manifestations of Systemic Disorders including HIV/AIDS

Endocrinology

Diabetes Mellitus, Disorders of the Thyroid, Parathyroid Disorders, Adrenal Disease, Disorders of Nutrition in the Adult, Disorders of the Hypothalamo-Pituitary Axis, Endocrine Disorders of Ovaries and Testes.

Gastroenterology

Jaundice, Diarrhoeal Diseases, Amoebiasis, Hepatitis, Intestinal Helminthiasis, Schistosomiasis,

Peptic Ulcer Disease, Upper and Lower GI Bleeding, GIT Malignancy, Diverticular Disease, Liver Cirrhosis, Liver Carcinoma, Liver Cell Failure

Haematology

Nutritional Anaemias, Haemolytic Anaemias & Glucose-6-Phosphate-Dehydrogenase Deficiency Disease, Sickle Cell Disease, Hypoplastic and Myeloblast Anaemias, Haemorrhagic Disorders, Polycythaemia and Myeloproliferative Disorders, Malignant Lymphomas, Multiple Myeloma, Thrombotic Diseases

Rheumatology

Autoimmunity and Connective Tissue Diseases, Lupus Erythematosus, Gout, Rheumatoid Arthritis, Osteoarthritis

Infectious Diseases

Malaria, Typhoid, Viral and Related Diseases, Acquired Immune Deficiency Syndrome – AIDS, Amoebiasis, Tetanus, Septicaemia, Sexually Transmitted Infections, Neglected Tropical Diseases

Oncology

Clinical Effects of Malignant Disease, Management of Malignant Disease, Management of Dying Patients and of their Relatives

Respiratory Medicine

Respiratory Infection – Upper and Lower Tract, Pulmonary Tuberculosis, Sarcoidosis, Pneumothorax and Pleuritis (wet and dry), Pulmonary Abscess and Empyema, Bronchiectasis, Bronchial Asthma, Obstructive Airways Disease and Respiratory Failure, Pulmonary Embolism, Pneumoconiosis

Neurology

Cerebrovascular Accident, Neuropathies, Epilepsy and other Seizures, Meningitis & Encephalitis, Parkinsonism and Motor Neurone Disease, Dementia, Myasthenia Gravis & Muscular Dystrophy

Renal Medicine

Water, Electrolyte & Hydrogen Balance, Urinary Tract Infections, Glomerulonephritis & Acute Renal Failure, Nephrotic Syndrome, Chronic Renal Failure

General Therapeutics

Prescription of Drugs: Principles, Ethical Considerations and Practice; Rational Drug Use
Therapy of Fever, Pain, Nausea & Vomiting, Diarrhoea & Constipation;
Use & Abuse of Hypnotics, Anxiolytics and Tranquillizers; Antidepressant Therapy;
Use and Abuse of Antibacterial Medications; Chemotherapy of Infections;
Chemotherapy of Malignant Disease;
Approach to Management of Substance Abuse including Alcoholism and Drug Addiction

2. Surgery (including Sub-Specialties)

Course Objectives

The surgery programme in basic medical training should be designed to enable students:

- get introduced to the methodology of ascertaining and collating the symptoms & signs of surgical illness
- co-ordinate previously acquired knowledge in surgical anatomy, surgical pathology and physiology and relate same to the symptoms and clinical presentation of surgical illness
- acquire and possess cognitive and psychomotor skills in the care of surgical patients, including the ability to identify relevant investigatory and surgical procedures in the management of surgical patients and be capable of performing basic tests and procedures
- to initiate management in surgical patients and discern the indications for seeking appropriate support
- acquire the appropriate skill to act objectively in emergency situations
- have the basic skills to fit in today's changes in the practice of surgery

Course Structure

The undergraduate training programme in surgery will be conducted through the following modes of instructions:

- Lectures & Tutorials
- Clinic Attendance
- Clinico-Pathological Conferences.

- Bedside Teaching.
- Seminars.
- Journal Reviews.
- Use of Computers/Surgical Informatics
- Minimal Access Surgery; Use of Laser in Surgery
- Molecular Biology and Surgery.
- Introduction to Management, Planning and Administration
- Communication Skills in Surgery

As appropriate, the following teaching aids will be utilized:

- Audio-Visual Aids.
- Clinical Models
- Simulations
- Side-Room Laboratory
- Computer informatics.
- Inpatient care which is to involve the student in:
 - Patient clerkship.
 - Correlation of nursing care with medical management
 - Investigatory concept and practice
 - Therapeutic decisions, modifications and applications

To achieve the cognitive and psychomotor skills for in-patient management, the student will take on patients in symbolic role of in-loco-surgeon without actually exercising the decision-making role of the patient. He will clerk patients as if he were the doctor. He will follow them up from day to day in the course of treatment until discharge.

Course Work in Surgery

The course work in surgery is in complete harmony with the course objectives of the clinical training programme, but is specific to the discipline of surgery and the related specialties of anaesthesia, ophthalmology and otorhinolaryngology (ORL).

The course objectives are to be attained, using the course structure in four postings that are interrelated within the clinical programme of training. The recommended postings are:

- Junior Surgery Posting
- Intermediate Surgery Posting
- Senior Surgery Posting (Major Surgical Sub-specialties)
- Senior Surgery (Other Sub-specialties: Anaesthesia, Ophthalmology & ORL)

Junior Surgery Posting

This is a sequential follow-up of the previous training in human and medical biology. The objective is to introduce students to the method of collating the clinical features of common surgical problems, utilizing the deductions so obtained to determine relevant investigatory and treatment procedures in the management of surgical disease.

Junior Surgery Lectures

- The Development of Surgery
- Concept and History of Surgery
- Surgical anatomy, symptoms and physical signs.
- Surgical physiology, symptoms and physical signs.
- Homeostasis: Bodily changes in Trauma and Surgery;
- Metabolic Responses to Surgery
- Shock: Causes and Management of Circulatory Collapse.
- Fluid and Electrolyte Balance in Surgical Patients
- Principles of Pre-operative preparation of the surgical patient.
- Wound Healings: Biological and Clinical Features.
- Blood transfusion and Disorders of surgical bleeding.
- Metabolism and Nutrition in surgical patients.
- Fever in surgical patients.
- Principles of Operative Surgery: antisepsis, techniques, sutures and drains.
- Surgical Infections and choice of antibiotics.
- Surgical Complications: Principles of Post-Operative Management.
- Hernias
- Trauma Management of the Acutely Injured Patient.
- Surgical Diseases of the Breast
- The Thyroid Gland
- Scrotal Swelling
- Surgical Diseases of the Stomach and Duodenum.
- Hepatobiliary Disorders
- Pancreatic Disorders
- Surgery of the Spleen
- Molecular Biology and Surgery
- Use of computer/internet
- Basic Principle of Business management, Planning and Administration.

Intermediate Surgery Posting

The aims are:

- to consolidate the knowledge which the student had obtained in the course of the Junior Surgery Posting and
- to enhance his skill in the correlative application of pathology, clinical and investigative diagnosis and the treatment of general diseases

General Surgery & Urology Instructional Topics

- The face, mouth and tongue
- The Neck.
- The Thyroid gland.
- Surgical diseases of the Breast.
- Oesophageal Disorders.
- Acute Abdomen.
- Intestinal obstruction.

- Surgical diseases of the stomach and Duodenum
- Hepatobiliary disorders.
- Pancreatic disorder.
- Surgery of the spleen.
- The small intestine and appendix.
- Surgical Disorders of the colon, Rectum canal.
- Urological anatomy and physiology
- History and physical examination in surgical urology
- Diagnostic procedure and instrumentation in Urology.
- Congenital anomalies of the Genito-urinary tract.
- Genito-urinary tract trauma.
- Surgical aspects of urinary schistosomiasis.
- Urinary tract infection.
- Urinary tract obstructions: renal stones.
- Paediatric Urology.
- Genito Urinary Neoplasm.
- Renal Failure.
- Congenital anomalies of the small intestine.
- Communication skills in surgery.
- Basic principles of Business Management, Planning and Administration II.
- Weekly Journal review.

Senior Surgery Posting in Major Surgical Specialties

This posting is designed to enable the student absorb the biological concept as it is applicable to the clinical management of surgical diseases in the sub-specialties of General Surgery, Urology, Orthopaedic Surgery, Paediatric Surgery, Dentistry, Plastic and Reconstructive Surgery, Thoracic and Vascular Surgery as well as in Neurosurgery.

Senior Surgery Posting Instructional Topics

Orthopaedics: Fractures and dislocations, Infections of Bones and Joints, Bone Tumours, Congenital disorders of musculo-skeletal system, Rheumatic disorders of the musculo-skeletal system, Amputation and limb substitution, Re-implantation of the extremities, Multiple injured patient (at the Site; Removal; Transit to Hospital; Triage, Blood Conservation & Replacement; Rehabilitation), The Hand, Infections of the musculo-skeletal system in the tropics

Paediatric Surgery: Paediatric Surgery, Respiratory Distress, Congenital Disorders in Neonates and Children, Acute Abdomen in Children, Neoplasm in Children, Surgical Care in Sickle Cell Disease, Early Diagnosis of Congenital Lesions.

Plastic and Reconstructive Surgery: Diagnosis and Management of Burns, Pathological Processes of the Epidermis, Malignant Tumours of Fibrous Tissue, Cancer of the Skin, Superficial Lumps, Principles of Skin Grafting and Skin Transportation, Alternatives to Skin Cover.

Thoracic and Vascular Surgery: Disorder of the Lymphatic System, Disorders of the Veins, Pulmonary Embolism, Surgery of the Arteries, Aneurysms, Thrombo-Obliterative Disease of the Aorta and its branches, Surgical Disorders of the Lungs, Pleura and Chest Wall,

Bronchoscopy, Thoracic Trauma, Lung Abscess, Bronchiectasis, The Pleura and Empyema, Surgical Treatment of Pulmonary Tuberculosis, Tumours of the Respiratory System, Thoracic Outlet Syndrome, Congenital Disorders of the Chest Wall, Surgical Disease of the Mediastinum, Cardiac Surgery, Cardiac Catheterisation, Cardio-respiratory Arrest: Prevention, Diagnosis and Management, Congenital Anomalies of the Heart and Great Vessels, Acquired Disorders and Cardiac Valvular Disease, Cardiac Neoplasms, Cardiac Pacemakers, Assisted Circulation.

Neurosurgery: Diagnostic Techniques in Neurosurgery, Spontaneous Intracranial Haemorrhage, Cranio-cerebral Trauma, Intracranial Infections, Intracranial Tumours, Spinal Disc Disorders, Spinal Infections, Spinal Tumours, Spinal Trauma, Peripheral Nerve Injury, Congenital Disorders in Neurosurgery, Neurosurgical Relief of Pain, Neurosurgical Treatment of Epilepsy, Principles of Stereotactic Neurosurgery.

Basic Practical Skills in Surgery

Should be Performed by Student

- Setting up i.v drip and management of i.v infusions
- Insertion and removal of urinary catheters.
- Suturing of lacerations.
- Incision and drainage of superficial abscesses.
- Preparation of patients for colonic and ano-rectal operation.
- Aspiration of fluid from the pleural space.
- Aspiration of fluid from the pericardial space.
- Application and removal of Plaster of Paris (P.O.P) cast
- Application of temporary splints.
- Making an electrocardiographic recording (ECG recording).
- Endo-tracheal intubation
- Aspiration of fluids from joint spaces
- Intra-articular instillation and injections
- Preparation of patient for surgery
- Tuberculin test
- Abdominal Paracentesis

Should be Observed by Student to Understand the Procedure & Adverse Effects

- Cut-down venostomy and cannulation, including central venous cannulation
- Establishment, management and removal of chest tubes.
- Electromyography.
- Tracheal aspiration.
- Laryngoscopy.
- Cystoscopy.
- Tonometry.
- Ultrasonography.
- Bone marrow aspiration.
- Intravenous Urography (IVU)
- Gastric intubation lavage.
- Gastroscopy
- Liver biopsy.
- Proctoscopy

- Sigmoidoscopy
- Suprapubic Bladder Catheterisation
- Renal Biopsy
- Lumbar puncture.
- Peritoneal & haemodialysis.
- Excision biopsy of simple lumps.

Senior Surgery Posting (Specialties Posting)

During this period, the student will be expected to acquire knowledge and relevant basic skills in the diagnosis, investigation and treatment of conditions and diseases in the specialties of anaesthesia, ophthalmology and otorhinolaryngology.

For a period of eight weeks, he will perform duties as a Junior House Surgeon” in the care of patients in the wards and as a junior Casualty Officer” in the reception and care of surgical emergencies. It is a period for the student to consolidate fully the knowledge and skill he has acquired in surgical training to enable him emerge into the profession as a confident and competent house surgeon.

During the specialties posting in Surgery, the student would be expected to acquire skills in the following procedures.

Anaesthesia

- Introduction to Anaesthesia including the Roles of the Anaesthetist in Resuscitation, Operative Management, Intensive Care and Pain Management
- Pre-operative Assessment, Preparation and Pre-medication.
- Principles and Uses of Anaesthetic Equipment and Breathing Systems.
- Techniques of Maintaining the Airway.
- Anaesthetic Techniques: General Anaesthesia - Inhalational and Intravenous Methods.
- Anaesthetic Technique: Regional Anaesthesia including Surface, Nerve Blocks, Spinal, Epidural, etc and Pharmacology of Local Anaesthetic Drugs.
- Choice of Anaesthetic method and Technique as influenced by Concurrent Medical Diseases and Patients’ Condition
- Monitoring during Anaesthesia and Patient Transport.
- Post Anaesthetic Care, Complications and Management.
- Management of Acute and Chronic Pain.
- Ambulatory (Day case) Anaesthesia.
- Administration of Fluids Electrolytes and Blood
- Intensive Care Therapy including Nutrition in the Critically Ill and Oxygen Therapy.
- Cardiopulmonary Arrest, Resuscitation and Ethical Issues.

Otorhinolaryngology

Ear Diseases

- Applied Anatomy and Physiology.
- History Taking and Examination in ORL
- Diseases of the External Ear.
- Otitis Media

- Complication of Otitis Media; Haematoma.
- Ear Trauma – Foreign body
- Temporal Bone Fracture
- Deafness and Audiology
- Tinnitus
- Vertigo and Balance Disorders
- Tumours of the Ear

Nasal Diseases

- Applied anatomy and physiology of the Nose and the paranasal sinuses
- Radiographic examination of the Nose and Sinuses
- Nasal Injuries: Foreign bodies, septal haematoma, nasal fractures
- Rhinitis and Rhinosinusitis.
- Nasal Polyps and Nasal Allergy
- Complication of Rhinosinusitis
- Epistaxis
- Mucocoele of the Paranasal Sinuses
- Naso-antral tumours

Throat Disease (Larynx, Pharynx and Oesophagus)

- Applied Anatomy and Physiology of the Throat
- Radiographic Examination of the Throat
- Traumatic Conditions – Foreign Bodies in the Oesophagus, Larynx and Pharynx
- Penetrating Neck Injuries e.g. Gunshot, Arrow and Stab Wounds.
- ORL Manifestations in HIV/AIDS patients
- Adenoids, Tonsillitis, Peritonsillar Abscess (Quinsy), Retropharyngeal Abscess.
- Tonsillectomy and adenoidectomy
- Stridor and Hoarseness
- Tracheostomy
- Respiratory Papillomatosis
- Tumours of the Larynx and Pharynx

Ophthalmology

- Applied Anatomy and Physiology of the Eye and Orbit.
- The Red Eye: Conjunctivitis, Corneal Ulcer, Iritis, Choroiditis.
- Eye Injuries: Contusion, Penetrating, burns (chemical and thermal), foreign bodies.
- Lesions of the eyelids: Chalazion, stye, trichiasis, entropion, ectropion.
- Gradual Loss of vision: Cataract, Glaucoma.
- Sudden Loss of Vision: Vitreous Haemorrhage, Central Retinal Arterial Occlusion & Venous Thrombosis, Retinal Detachment.
- Strabismus.
- Optic Nerve disorders: Neuritis, Papilloedema, Atrophy
- Errors of refraction: Myopia, Hypermetropia, Astigmatism and Presbyopia
- Community Eye Care: General Ocular Hygiene, Harmful Traditional Eye Medication including Couching

- Nutritional Eye Diseases: Vitamin A Deficiency.

During the course of training in Ophthalmology, the student would be expected to acquire skills in the following procedures.

- Visual Acuity Testing with Snellen's Chart.
- Eye Drops and Eye Ointment Application.
- Foreign Body Removal (Corneal and Conjunctival)
- Direct Ophthalmoscopy

3. Obstetrics and Gynaecology

Objectives

At the conclusion of his programme in Obstetrics & Gynaecology, the medical student would have acquired knowledge, skills and attitudes which would enable him to:

- Appreciate the principles and practice of the speciality of obstetrics and gynaecology on the basis of the biology of human pregnancy, labour and puerperium.
- Collate the symptoms and physical findings, record, name methodically and analyse the corpus of information towards objective care in obstetric and gynaecological patients.
- Acquire knowledge to become familiar with the common gynaecological illnesses.
- Understand the principles and practices of antenatal care
- Become familiar with various obstetric situations and be capable of making accurate clinical decisions followed by appropriate action in such cases.
- Understand the principles of preventive gynaecology, especially as they relate to primary health care in obstetrics and gynaecology and reproductive health.

Instructional Topics in Gynaecology

- Applied Anatomy of the Female Genital Tract
- Ovarian structure and function.
- Clinical Aspects of Ovarian Function: Puberty, Menstrual Cycle and Menopause
- Aids to diagnosis of Ovarian Dysfunction
- Development of the Female Genital Tract: Congenital Anomalies, Intersexuality
- Amenorrhoea
- Uterine Bleeding
- Tubo-Ovarian Infection
- Diagnosis and Management of Infertility
- Disorder of the Pelvic Floor: Utero-Vaginal Prolapse, Incontinence of Urine.
- Vesico-Vaginal Fistula and Recto-Vaginal Fistula
- Gynaecological neoplasms.
- Trophoblastic Diseases
- Sexually Transmitted Diseases.
- Chronic Vulval Diseases
- Gynaecological Emergencies.
- Endoscopy and Ultrasonography in Gynaecological Practice
- Principles and Ethics of Assisted Reproductive Technology

- HIV/AIDS.
- Family planning.
- Abortion & Post abortion care
- Ectopic Pregnancy.

Instructional Topics in Obstetrics

- Diagnosis of pregnancy.
- Reproductive physiology.
- Ante-natal care.
- Physiological changes in pregnancy.
- The placenta, amniotic fluid.
- The physiology of lactation.
- Anaemia in Pregnancy.
- Malaria in Pregnancy.
- Sickle Cell Disease in Pregnancy.
- Pre-eclampsia and Eclampsia.
- Hypertension in Pregnancy.
- Hydramnios and Oligohydramnios.
- Diabetes Mellitus in Pregnancy.
- Cardiac Disorders in Pregnancy.
- Chronic renal disease in pregnancy, renal failure.
- Endocrine Disorders and Pregnancy.
- Infections in Pregnancy
- Premature Labour; Postmaturity
- Intra-Uterine Death; Destructive Procedures
- Antepartum Haemorrhage.
- Coagulation Disorders in Obstetrics
- Nausea and Vomiting of Pregnancy
- Physiology and Conduct of Normal Labour and Delivery.
- Abnormal Labour and Delivery: Dystocia; Use of Partogram.
- Trial of Labour; Management of Prolonged Labour; Obstructed Labour
- Abnormal Fetal Presentations.
- Multiple Gestation
- Induction of Labour
- Postpartum Haemorrhage.
- Normal Puerperium; Puerperal Morbidity
- Maternal Mortality and Safe Motherhood.
- Biological and Social Factors in Obstetrics.
- Post-Natal Examination.
- Organisation of Maternity Services in a Community
- Radiography and Imaging Studies in Obstetrics
- Assisted Delivery; Caesarean Section
- Anaesthesia in Obstetrics
- Pain Relief in Labour.
- Prenatal and Postpartum Detection of Congenital Abnormalities in the Baby

- Birth Trauma.
- Neonatal Resuscitation.
- Perinatal Mortality.
- Sexually Transmitted Infections and HIV/AIDS in Pregnancy

Basic Practical Skills in Obstetrics and Gynaecology

- Setting up intravenous (IV) drip and management of IV infusions.
- Insertion and removal of urinary catheters.
- Preparation of patients for minor and major operations.
- Passage of various forms of vaginal specula.
- Culdocentesis and paracentesis.
- Partographic monitoring of labour.
- Conduct of a normal vaginal delivery.
- Conduct of breech delivery
- Conduct of a twin delivery.
- Repair of episiotomies and perineal tears.
- Repair of cervical lacerations.
- Insertion of intrauterine contraceptive device.
- Induction and augmentation of labour.
- Manual removal of the placenta.
- Management of third stage of labour to prevent postpartum haemorrhage.
- Administration of appropriate oxytocics in labour to treat postpartum haemorrhage.
- Administration of drugs (sedatives, anticonvulsants and anti-hypertensives) to prevent and treat eclampsia.
- Management of incomplete abortion with manual vacuum aspiration.
- Assist in Caesarean section delivery.

4. Paediatrics and Child Health

Aims and Objectives

General

- To introduce the student to the global principles and practice of Paediatrics and Child Health, with particular emphasis on practice in the tropics
- To enable students know the principles of IMNCH (integrated management of mothers, newborn and children's health)
- To equip the students with the cognitive knowledge, technical skills and clinical judgement, to enable them achieve some measure of competence and reasonable confidence in the practice of Paediatrics.
- To enable the students have a good working relationship with all those involved in health care delivery especially with respect to maternal and child health, and to appreciate the need for this team work.
- To enable students have some knowledge of the epidemiology of childhood diseases in Nigeria

Specific

At the end of the course, the student should be able to utilize the skills and attitude acquired to perform the following:

- Take and record a good history
- Carry out a thorough physical examination of a child
- Demonstrate common abnormal physical signs and interpret them
- Carry out simple side laboratory tests and routine Paediatric procedures

The students' ability to appreciate the usefulness of the skills he or she has acquired, presupposes a theoretical background to enable him or her.

- Recognise childhood disease, especially those prevalent in the Nigerian environment;
- Formulate a reasonable diagnosis based on history and physical examination.
- Confirm his diagnosis by selecting and carrying out appropriate investigations.
- Have a sound knowledge of therapeutics in order to be able to treat his patient.
- Manage common paediatric conditions and know when and where to look for help and when to refer them safely to the care of a specialist.

Course Content

Introduction to Paediatrics

(a) Lecture/Tutorials

These are aimed at providing the student with basic knowledge of the discipline for general practice. These lectures cover a wide range of selected topics in Paediatrics to include general principles and practice Paediatrics, preventive Paediatrics, growth and development (from infancy to adolescence) including growth condition monitoring and pathological states in paediatrics in all systems.

(b) Clinical Paediatrics

- The students are taught the art of paediatric patient clerking in the outpatient clinics and in the children's emergency room and wards. A student is expected to clerk and if possible present, at least 6 cases per posting.
- Instructions in diagnostic and therapeutic skills *e.g.* simple examination of the different body systems and eliciting the relevant physical signs
- Reasonable competence in clinical procedures *i.e.* venepuncture, setting up of intravenous infusions, performance of lumbar punctures, resuscitation of patients and respiratory or cardiac failure, and exchange blood transfusions
- Each student is expected to perform simple laboratory procedures on specimens obtained from his/her patients, *e.g.* CSF, urine and stool such as microscopy and chemistry, and acquire therapeutic and diagnostic skills including basic competence in principles of Radiology, and other imaging techniques. The student, on Ward Round Day, should present the patient he/she clerked to the Consultant, and follow up the patient's progress till discharge. He/she is also expected to write a discharge summary.

(c) Child Health and Primary Care

Students should visit Child Health Clinics and should be instructed in the care of health infants. They also must pay visits to the Under-Fives Clinic, where they are individually expected to perform such functions as:

- Immunization procedures
- Assessment of nutritional status of children
- Anthropometry, and giving nutritional advice to mothers
- Conduct seminars on environmental and social factors related to child health
- Acquire competence in the rudiments of prevention and management of physical handicap in children as well as rudiments of management and competent referral of children who have significant variations in intelligence.

Instructional Topics in Primary Care

- Poisons and Accidents
- Kerosene ingestion
- Household accidents – Burns.
- Drug poisoning (salicylate, barbiturate, insecticide poisoning etc)
- Dog and snake bite.
- Reasonable investigation of the accident – prone family.
- Miscellaneous
 - The handicapped child
 - Neurosis and psychosis in childhood
 - Child abuse
 - Child rearing and behavioural problems
 - Immunization in general for the Nigerian child
 - Weaning – normal and abnormal habits.

(d) Nutrition/Growth and Child Development Surveillance (CDS)

- Compulsory attendance at the Nutrition Clinic for instruction on the nutritional needs of normal children and those with disorders such as protein-calorie malnutrition and marasmus
- Technical skills of anthropometry should be taught and instructions given on the use and value of the growth charts. Factors affecting growth and development of children should also be highlighted.
- Failure to thrive/causes and management
- Identification and treatment of correctable developmental challenges
- Puberty, Adolescence and its problems
- Vitamin Deficiency

Diseases of Specific Organ Systems

Diseases of the Cardiovascular System

- Nomenclature; sequential chamber analysis
- Examination investigation of the CVS.
- Congenital Heart diseases.
- Rheumatic heart disease and infective endocarditis

- Heart failure in infancy and childhood.

Diseases of the Respiratory System

- Acute infections of the respiratory tract
- Chronic respiratory conditions:
 - Bronchial asthma
 - Pulmonary tuberculosis.
 - The wheezing Child.
 - Lung abscess and bronchiectasis
 - Congenital anomalies of the respiratory tract:
- Tracheo-oesophageal fistulae; Respiratory distress syndrome.
- Congenital lobar emphysema.

Diseases of the Digestive Tract

- Acute diarrhoea and vomiting
- Fluid and electrolyte imbalance; Oral Rehydration Therapy (ORT)
- Hepatitis; Jaundice, Conjugated hyperbilirubinaemia
- Intestinal Parasites
- Abdominal pain
- Malabsorption
- Gastro-intestinal tract bleeding.

Disease of the Genitourinary Tract

- Developmental and structural anomalies of the genitourinary tract
- Urinary tract infections.
- Glomerulonephritis
- Nephrotic syndrome
- Renal failure (acute and chronic)

Endocrine and Metabolic Diseases

- Hypothyroidism & Hyperthyroidism
- Diabetes mellitus; Hypoglycaemia.
- Hypovitaminosis: Rickets.
- Precocious Puberty; Delayed Puberty.
- Congenital Adrenal Hyperplasia.

Diseases of the Central Nervous System

- Acute infections: meningitis, encephalitis, etc
- Hydrocephalus: causes and complications.
- Microcephalus: causes and complications
- Convulsions in infancy and childhood
- Coma.
- Cerebral Palsy.
- Variations in Intelligence: mental subnormality, superior intelligence.
- Disease of neuromuscular system.

Diseases of Muscles and Bones

- Osteomyelitis.
- Pyomyositis
- Leukaemia

- Bleeding disorders.

Miscellaneous

(a) Specific Infections

- Measles, Pertussis and Mumps; Malaria; Tuberculosis; Salmonellosis; Giardiasis; Schistosomiasis; HIV/AIDS.

(b) Genetics

- Types of Genetic Disorders, Monogenic Disorders, Chromosomal Abnormalities, Congenital Malformations, Prenatal Diagnosis, Genetic Counselling, Ethics in Genetics.

(c) Paediatric Oncology

- Burkitts Tumour, Nephroblastoma, Neuroblastoma, Hepatoblastoma, Tumours of the Central Nervous System, Craniopharyngioma, Retinoblastoma, Reticulo-endothelial malignancies, Soft tissue sarcomas.

d) Neonatology

Students should spend 7 – 14 days (minimum) in the Newborn Unit to acquaint themselves with normal neonates, the problems of the newborn infant and their prevention.

Instructional topics:

- Normal Newborn. Infant Feeding
- Low Birth Weight Babies
- Haematology of the Newborn
- Birth Asphyxia
- Intra Uterine Infections
- Acute and Chronic Infections of Childhood including HIV/AIDS
- Temperature Control
- Helping Babies Breathe
- Metabolic Problems

5. Mental Health

General Objectives

Every medical school should aim at the establishment of a Department of Psychiatry or Mental Health and have attached to it a separate ward facility for short term care of acute psychiatric patients. Such facilities help to give students the general orientation to psychiatric care, liaison practice and inter-relatedness of disciplines, and it stimulates appropriate faculty development.

Departments of Psychiatry should play an active role in the teaching, research and development of communication skills and interpersonal relationships especially of the doctor-patient relationship and in the provision of Mental Health Services at the Primary Health Care level.

Departments of Psychiatry should also establish links with long stay psychiatric institutions in the locality, so as to offer students exposure to the full range of mental health services.

Training Facilities

Every medical school should have:

- A Department of Psychiatry (or Mental Health)
- A separate ward facility for short term care of acute patients.
- Collaborative mental health practice with a primary health care centre
- Link with long-stay psychiatric Institutions in the locality.

Course Duration

The clinical psychiatry course should last a minimum of 4 weeks. About eight (8) weeks are actually required to teach psychiatry in medical school. It should be taught after the junior clerkship in medicine and surgery. Students should have had a course in Medical Psychology (or Behavioural sciences) in preclinical years.

Exposure during Training

Students should participate in clerking, physical and mental status examinations, psychological testing and laboratory investigation of patients. Students should see a range of patients including those typically managed in primary care, general hospital, and community based clinics as well as those treated in psychiatric facilities. They should have the opportunities of visiting long stay psychiatric institutions and institutions for persons with intellectual disability and other disadvantaged children.

Students should participate in the clinical management and community based care of patients.

Course Objectives

- The acquisition of appropriate attitudes is of primary importance. It is important that the objective of imparting these attitudes is in the teacher's mind throughout his interaction with students. However, each school should have a clear plan that ensures that the necessary attitudes have been acquired by the time the students graduate. It is important that students develop appropriate attitudes to psychiatry as a medical discipline. These attitudes will be encouraged particularly during the teaching of psychiatry but it is important that they are not negated during the teaching of other subjects.
- The knowledge objectives of psychiatry include psychiatric symptoms and syndromes, psychological aspects of medical disorders, ("psychological medicine"), and psychosocial issues including stigma. Psychiatric symptoms and syndromes, and their treatment, are to be taught and learned in the context of an integrated biological, psychological and social approach.
- Acquisition of appropriate and relevant skills. They include the skills of:
 - "active listening", empathy, non-verbal communication,
 - opening, controlling and closing an interview,
 - Information gathering skills,
 - taking a history of patient's complaints and a life history,
 - conducting a physical examination,
 - assessing the functioning of the patient's family and
 - assessing the patient's family's ability to contribute to the patients' care

- Information evaluation skills
 - Select the crucial pieces of information for making a diagnostic formulation and undertake a differential diagnosis
 - Make a personality assessment
 - Evaluate the role of personal and social factors in the patient's behaviour
 - Formulate a plan of management which includes the points at which referral to a specialist will be appropriate.
- Information-giving skills
 - Pass information to patients to promote health.
 - Explain the implications of a diagnosis.
 - Inform patients about the beneficial and potential adverse effects of treatment.
- Reporting skills: Report verbally or in writing to:
 - Medical colleagues, lay people including the relatives of patients.
 - Non-medical agencies involved in the care of patients.
 - Promoted public education.
- Treatment skills
 - Promote compliance with prescribed treatment.
 - Basic prescribing skills for the psychiatric disorders commonly encountered by non-psychiatrists.
 - Recognise adverse effects of treatment and distinguish them from symptoms of illness.
- Learning Skills – sustain self-directed independent learning such that the student will be able to keep abreast with new advances in psychiatry and psychological aspects of medical practice throughout professional life.
- Teamwork skill – co-operate with:
 - Medical colleagues.
 - Other health care workers.
 - Patient and family organizations
 - Community services.
 - The general public
 in arranging the care of patients with psychiatric problems and for promoting mental health.

Core Lectures

- Historical and theoretical trends in psychiatry. The contributions of the following:
- Hippocrates, Paracelsius, Philippe, Adeoye Lambo *etc.*
- The Brain and the Mind: Review of the Anatomy, Physiology and Chemistry of the Central Nervous System. The Limbic System, Emotions
- Genetics and Psychiatry
- Etiological issues in mental health – predisposing and precipitating factors
- Classification and Diagnosis of Mental Disorders – ICD 10 and DSM IV
- Psychopathology – Psychiatric symptoms. Disturbances of motor functions, disorders of thinking, disturbances of perception, disturbances of cognition.
- The Clinical Interview - Including physical and mental status examination. Laboratory investigation; diagnostic formulation and recommendations.
- Organic Psychiatric disorders - Delirium, dementia and amnesic disorders

- Other – Psychiatric disturbances secondary to underlying general medical conditions
- Psychoactive substance use related disorders. Different patterns of presentations. Abuse, dependence, induced psychosis and intoxication; Psychological and biological theories of substance use.
- Psychosis, Schizophrenia and related disorders includes differentials and methods of management of chronic and resistant cases
- Mood disorders - Classification and diagnosis, Methods of management, Emphasis on prevalence and management of depression in primary health care settings.
- Stress related disorders – Acute stress reaction, Post traumatic stress disorder, Adjustment disorders.
- Anxiety-Related Disorders – Phobic Disorders, Generalized Anxiety Disorder, Panic Attack/Disorder, Obsessive-Compulsive disorder, Diagnosis and Management. Presentations in primary health care settings.
- Somatoform Disorder; Dissociative Disorders
- Disorder of eating, sleeping, and psychosexual functions.
- Gender identity disorders, Transexuality, Paraphilias
- Concept of personality
- Defence mechanisms and Personality Disorders.
- Intellectual Disability – Classification, Assessment and Management
- Childhood Psychiatric Disorders – Examination of the Child, Adjustment Reactions,
- Attention Deficit Hyperactivity Disorder, Conduct Disorders, Autism, Enuresis, Encopresis and Sleep Walking
- Old Age Psychiatry.
- Care of the elderly, Psychiatric diagnosis in the elderly, use of medication.
- Deliberate self-harm and Suicide.
- Dangerousness and the Management of Potentially Violent People
- Physical Abuse of Children and Adults
- Psychiatric Emergencies
- Psychopharmacology
- Basic Science of Psychopharmacology
- Antipsychotic drugs – typical and atypical, antipsychotics, side effects and methods of prevention and treatment
- Antidepressants
- Other psychotropic drugs
- Other forms of physical treatment: Electroconvulsive Therapy: Psychosurgery; Abreaction.
- Principal methods of psychological treatment.
- Supportive psychotherapy, cognitive behavioural psychotherapy, individual and group psychotherapy. Introduction to psychoanalysis. Psychodrama
- Principles of psychiatric care in non-psychiatric settings and in the community.
- Highlight possible roles of the religious homes and the native healers.
- Community mental health services. Primary health and mental health services. Evaluation of community mental health care.
- Forensic Psychiatry Principles of Justice, Expert Witness, Privileged Communication, Involuntary Admission, Competency and Civil Rights, Criminal Responsibility, Competence to Stand Trial

- Psychophysiological Disturbances: Peptic ulcer, essential hypertension, bronchial asthma
- Research in Psychiatry: methods in behavioural research, biostatistics and current trends in psychiatry research, evidence-based practice.

6. Community Health and Primary Health Care

For effective functioning, the training of medical under-graduates must be community based, community oriented and integrated on problem solving basis, bringing together, as much as possible, all disciplines in the field of Medicine.

Aims and Objectives

The overall aims of the undergraduate training in Community Health must be:

- To introduce to the students the concept of community health and its relevance in the health care delivery system of Nigeria.
- To equip the students with the knowledge and skills to be able to carry out epidemiological studies to identify the prevalent health problems in the community and also to determine ways and methods of alleviating these problems.
- To equip the student with the knowledge and skills to be able to plan, organize and evaluate appropriate health programmes (promotive, preventive, curative and rehabilitative) in collaboration with other members of the health team in order to reduce mortality and morbidity in the community and also to improve the quality of life generally.
- To develop in the student the spirit of team work in promoting health in all population groups of Nigeria.

The summary of the teaching and learning programme for the course is provided in Table 6:2 below:

Table 6:2

Course Outline for Community Health Training in Medical Schools

PRE – CLINICAL	1st Year	History of Medicine, Human Ecology/Medical Sociology and Introduction to Descriptive Biostatistics
		Environmental Health, Introduction to Primary Health Care, Introduction to Demography, Health Education and Field activities.
CLINICAL	2nd Year	Principles of Epidemiology, Health Management, Maternal and Child Health Care, School Health Services, Inferential Biostatistics, Occupational Health, Infectious disease Epidemiology and Medical Ethics.

	3rd Year	Research Methods in Public Health, Non-communicable disease Epidemiology, public Health Nutrition, Health Economics, Epidemiology of zoonoses, Educational posting, Endemic Disease and STD clinics.
	4th Year	Social Medicine, International Health, Family life and Reproductive Health, Clinical Dietetics, Group Dynamics, Integrated Primary Health Care posting, Seminars and Tutorials.

First Year Teaching Programme

History of Medicine

Paleomedicine, Primitive Medicine, Ethnomedicine, Alexandria and Rome (300 BC), Medieval Medicine (500 to 1,500 AD), Renaissance Medicine (15th to 16th century AD), History of Medicine in Nigeria

Human Ecology/Medical Sociology

Ecological concepts; Components of the environment (physical biological and social); Man's interaction with the environment: (adaptation process, balance and changes); Human organizations and systems; Description of human population; Behavioural concepts in public health; Classification of health behaviour and practices; Change processes; The community as a laboratory, Traditional and Modern Health Systems

Introduction to Biostatistics

Role of statistics in Human Biology and Medicine; collection and organization of data, scales of measurement: Presentation of data; Measures of central tendency and location; Measures of variability; Introduction of probability theory and inductive statistics; Estimating population values;

Environmental Health

The Physical Environment of Man and Health; Components of environmental sanitation; Water supply and Wastes Disposal; Control of Vectors; Control of Air Pollution; Residential Environment and Health; Town Planning; Food Hygiene; Public Health Legislation & Environmental Health.

Introduction to Primary Health Care Concept:

Objectives

To introduce the students to the objectives, concepts, and organization of primary health care, within the global social movement of "Health for all by the year 2000"

- History of Primary Health Care
- Objectives of Primary Health Care
- Components of Primary Health Care
- Organisation of primary Health Care
- Implementation machinery for Primary Health Care

Introduction to Demography

- Sources of population data
- Sources of health and vital statistics
- Measurement of health and disease

- Measurement of fertility and mortality
- Standardization of vital rates
- Population dynamics, structure and growth
- Interaction between medical action and population
- Health and population growth

Principles and Methods in Health Promotion and Health Education

- The identification of Living Needs
- Planning Health Education for Individuals, Groups and Communities
- The Principles of Communication
- Selection and Production of Appropriate Audiovisual Aids

Field Activities

Objectives:

To introduce the students to the community and sensitize them to community health needs problems whilst also displaying to them the ecological interplay between man and his total environment.

Specific Learning Objectives of the Field Activities

- Identify and interview the important people in the community.
- Produce a simple map of the area.
- Produce a simple census and construct the demographic characteristics of the community.
- Survey – the existing social facilities available in the community; health facilities, including data on disease pattern; educational institutions; religious institutions; electricity supplies; water supplies, environmental sanitation facilities; road network; recreational facilities; social clubs and organizations.
- Observe the life pattern of the people and their major occupation.
- Survey health problems/health needs of the people.
- Describe the various relationships between man and his environment in the community.
- Conduct (optional) health-related studies, with the guidance of the faculty supervisors.
- Write a report of the community-based experience.
- Present the report to a joint student/staff/community Meeting.

Second Year Teaching Programme

Principles of Epidemiology

- History and Definition of Epidemiology
- Spectrum of Health and Disease.
- Measures of diseases frequency – prevalence and Incidence rates.
- Descriptive Epidemiology – Distribution of diseases in relation to – Person, Time and Place
- Sources of morbidity and mortality data
- Concept of Epidemicity, Endemicity, and Pandemicity
- Epidemiological Orientation of Health and Disease

Health Management

- The Functional Management
- Organisational Structure
- Integration of Services for Primary Health Care
- Problem-solving in Management
- Management of Staff, Transport, Drugs, Equipment and Supplies in Primary Health Care
- Budgeting and Accounts
- Basic Operations Analysis Techniques for Monitoring

Maternal and Child Health Care

Lecture and visits to Primary Health Care Clinics.

School Health Administration

- Objectives of School Health Administration
- Components of School Health Programmes
- The Healthful School Environment
- Schools and the Community Health System

Inferential Biostatistics

- Introduction to probability theory and inductive statistics;
- Statistical significance of a difference; Tests of significance -
 - Normal Distribution
 - Z-test
 - Students t-test
 - Binomial test
 - Chi Square test.
- Association, Correlation and Regression

Occupational Health

- History of Occupational Health
- The Environment of Working Places
- Common Occupational Health Problems in Nigeria and their Control
- The Health Problems of Agricultural Workers.
- National and International Regulations Relating to Occupational Health.
- Health Implications of Lakes, Dams and River Basins

Infectious Diseases Epidemiology

- Concept of Epidemiologic Triangle of Agent, Environment and Host
- Principles of Diseases Control; Principles of Disease Eradication
- Epidemiology and Control of Locally Endemic Communicable Diseases
- Point Source versus Propagated Epidemic

Medical Ethics

- The Importance of the Community in Medical Education

- The Components/Sub-Specialities of Community Health
- History and Evolution of Medical Ethics.
- International Code of Medical Ethics.
- Duties of Doctors.
- Ethics of Medical Research.
- The Doctor and the Law, Judicial Coroner's Court
- The Medical & Dental Council of Nigeria
- Professional Negligence/Responsibility/Confidentiality/Misconduct
- Medical Indemnity/Professional Practice Insurance.

Third Year Teaching Programme

Research Methods in Public Health:

- Formulation of Hypothesis
- Testing of Hypothesis
- Prospective/Cohort, Retrospective/Case-Control, Longitudinal, Cross-Sectional, Intervention Studies
- Causal and Non-Causal Association
- Estimation of Risk – Odds Ratio (OR), Relative Risks (RR), Attributable Risk (AR)
- Sampling design – Simple Random, Systematic, Stratified, Cluster and Multi-stage Sampling
- Design of Health Surveys
- Questionnaire Design and Data collection, Analysis and Interpretation
- Critique of Scientific Papers

Non-Communicable Diseases Epidemiology

- Principles of Non-Communicable Diseases.
- Prevention and control of Non-Communicable Diseases - Hypertension, Diabetes Mellitus, Obesity, Cardiovascular Diseases, Asthma & Chronic Obstructive Pulmonary Disease, Malignancies, Sickle Cell Diseases, Road Traffic Accidents etc.

Public Health Nutrition

- Nutrition and Health
- Epidemiology and Control of Common Nutritional Problems in Nigeria
- Infection and Nutrition
- Nutritional Values of Common Nigerian foodstuff
- Food Policy, Hygiene and Toxicology
- Nutritional Requirements during Pregnancy, Lactation, Infancy and Childhood Through Adolescence and Relationship to Disease Conditions
- Assessment of Nutritional Status
- Nutrition Education

Health Economics

- Sources of Health Care Funding
- National Health Care Financing
- National Health Insurance Scheme

Epidemiology of Zoonosis

- Definition and types of Zoonosis
- Prevention and Control of Common Zoonoses - Rabies, Brucellosis, Anthrax, etc.

Integrated Community Health Lectures and Seminars

- Principles of Disease Control; Principles of Disease Eradication
- Epidemiology and Control of Locally Endemic Communicable Diseases
- WHO Special Programme for Tropical Diseases: Malaria, Schistosomiasis, Filariasis, Leishmaniasis, Trypanosomiasis and Leprosy
- Vaccines of Public Health importance: types and characteristics; storage requirements; effectiveness; mass immunization campaigns
- Epidemiology and Control of Hospital infections.
- Non-communicable Diseases Hypertension, Diabetes Mellitus, Malignancies, Sickle Cell Disease, Road Traffic Accidents *etc*

Educational Posting/Field Activities

This consists of lectures and guided public health educational visits to various public health programmes including the following:

- Environmental health services; visits to water treatment plants (water works), sewage treatment plants, markets, abattoirs and other processing factories and refuse disposal systems, comfort stations, etc.
- Community Welfare services, lectures and visits to Remand Home; Homes for motherless and handicapped children, prisons, school for the deaf etc.
- Public Health Department: lectures and visits to familiarize them with the activities of the department.
- Public Health Laboratories: lectures and demonstrations on their activities including testing of water *etc*
- Control of Communicable Diseases: visits to Tuberculosis Clinic & Infectious Diseases Clinics, Endemic Disease Clinic for sexually transmitted diseases and parasitic diseases.
- Occupational Health services: lectures and visits to selected industries.

Fourth Year Teaching Programme

Social Medicine

History of Social Medicine; The underprivileged members of society; Classification and causes of Disabilities; Programmes for Persons with Disabilities; Social Welfare Services in Nigeria and other countries.

International Health

Origins and Development of International Health; the World Health Organization; International Health Regulations; Other Government and Non-governmental Organisations involved with international Health.

Family Life and Reproductive Health

- Concept, components and objectives of Family Health
- Measurement in Family Health
- Health problems of mothers and children in Nigeria
- Determinants of Health of Mothers and children

- Objectives and organization of MCH programmes
- Practice of family health
- Immunization programmes
- Population Dynamics and family planning
- Evaluation of family health programme
- Clinical Dietetics
- Nutritional basis of disease - Renal, Liver G.I., Diabetes, Hypertension *etc*
- Application of Nutrition to the management of clinical problem,
- Parenteral Nutrition
- Review of different methods of infant feeding in Nigeria and other developing countries.
- Micronutrients Deficiency

Group Dynamics

Concepts of Group Dynamics; Group interaction; Selection of group leaders.; Selection of group members; Selection of research topics

Integrated Primary Health Care Posting

All Clinical departments in the Medical School should contribute toward the successful implementation of this posting, with the Department of Community Medicine as the co-ordinating Unit.

Objective

To introduce the students to the concept of Primary Health Care and to instill in them the technical and managerial skills, attitude and knowledge to operate at the primary health care level.

Course Content

Each student on qualification must have:

- A thorough understanding of the principles and concepts of primary health care and how to apply them in the provision of the services.
- An understanding of and participation in the process of setting up a primary health care system as follows:
 - Define a target population.
 - Mobilise the community in the target population so as to achieve their full participation in and ownership of the system to be developed.
 - Carry out a situation analysis of the target population.
 - Using the analysis, design the service system that will be accessible to **everyone** in the community where they live and work.
 - The design will include the
 - Structure, for example the levels of the service, the need for health facilities – number and type etc.
 - Health team, composition, disposition and functioning.
 - Process of providing health services of good quality (quality assurance)
 - Management of the health system

- Financing of the health system.
- Development, installation and use of the health information system.
- Process of supervision, monitoring and evaluation of the services.
- Process of identifying and providing the training needs of health personnel.
- Principle, methods and use of operations research in health care delivery.
- Design the implementation, through the system of the services that will tackle the priority health problems so as to have the greatest measurable impact on reducing mortality and morbidity in the community. These include stating the skills to perform the tasks required at community and health centre levels and the staff required to carry them out.
- Family Health, (reproductive and child health including family planning)
- Immunization.
- General Medical practice.
- Environmental Health, including provision of potable water.
- Nutrition.
- Health Education
- Early diagnosis and treatment of common diseases

Course Duration

This posting is to last for a period of 8 weeks which should be spent in selected urban/rural settings. During the period, students shall be required to gain experience in the following areas:

- Family Health (Maternal and Child Health/Family Planning)
- Immunization against common communicable diseases
- Health Management
- General Medical practice (Curative medical services)
- Community Mobilization and Health Education
- Environmental Health - provision of potable water and hygienic disposal of all wastes
- Promotion of Nutrition, including Agricultural Extension Activities.
- Collection of relevant data, and organization and Evaluation of Health Programmes.
- Acting as a medical officer in charge of a health post
- Health education
- Carrying out of specific community health Research.
- Home visiting (including Home Economics)
- Training and Supervision of Auxiliaries and other Health Professionals
- Referral Services

7. Family Medicine

The aim of the course in General Medical Practice/Family Medicine is to make the medical students aware that a properly trained doctor is basically equipped to initiate appropriate and effective management of human ailments irrespective of which ever specialty the patient would eventually end up in. Any doctor should be able to accurately diagnose and conclusively manage simple ailments in all specialties and also be capable of detecting those

disease conditions or developments and progressions in any ailment which demand as of necessity, reference to a specialist.

At the end of the course the medical student would be expected to have acquired skills in precise and concise history taking from patients, prompt diagnosis of disease conditions appropriate use of investigations and effective drug prescription. The student would also be able to appreciate the necessity of team-work, effective leadership and prudent resources management in Medical Practice.

Course Duration

The course in Family Medicine should last for a minimum of 2 weeks.

Course Outline

- Introduction to general practice, including the history of General Medical Practice and highlighting the need for the General Medical Practitioner in contemporary society
Characteristics of Primary Care
- History of Medicine
- Concise and Precise history taking and prompt diagnosis. The concept of health, illness and disease. Influence of family and culture on health and family dynamics.
- Cost effective Prescriptions.
- Principles of Holistic Patient Management
- Making a diagnosis from indifferentiated symptoms
- Management of common medical ailments - Fever and Convulsion; Malaria; Arthritis; Helminthic Infestation; Meningitis; the Unconscious Patient, Respiratory Tract Infection; Sickle Cell Diseases; Anaemia; Hypertension; Diarrhoea and Vomiting (in adults and children); Salmonella infections; Cholera; Amoebiasis; Hepatitis; Diabetes Mellitus; Sexually Transmitted Infections, HIV/AIDS; Urinary tract infection; Poisoning; Snake Bites; Dog Bites; Insect and Scorpion Stings; Anxiety States; Grief and Stress and palliative care of the terminally ill
- Common Surgical conditions that can be handled in General Practice – Appendicitis; Abscesses; Simple fractures; Simple hernias; Wounds and injuries; Circumcision
- Common Gynaecological and Obstetrical conditions that can be handled in General Practice - Bartholin's Cyst; Vaginal Discharge; Sexually Transmitted Infections; Ectopic Pregnancy; Ante-Natal Care; Labour; Antepartum Haemorrhage; Postpartum Haemorrhage; Neonatal Resuscitation; Neonatal Jaundice
- Laboratory Investigations in General Medical Practice
- Medical Ethics and Medical Jurisprudence, including Rules of Professional Conduct and highlighting specific unethical practices such as advertising, enticement *etc.*
- Economics and Administration in General Medical Practices
 - Procedures and Requirement for setting up and managing small scale practices.
 - Sources of funds and optimal fund utilization
 - Basic principles of budgeting and budget control.
 - Costing and cost structures.
 - Services pricing.
 - Inventory and Inventory control.
 - Medical records keeping.
 - Basic principles of personnel management

- Staffing of private clinics and hospitals.
- Laws and regulations guiding medical practice
- Decree 23 of 1988: Medical and Dental Practitioners Decree.
- State hospital registration edicts.
- Rules of professional conduct for Medical and Dental practitioners in Nigeria.
- Preventive medicine in General Practice.
- Environmental medicine in General Practice.
- Occupational Diseases and Industrial injuries and sports Medicine.
- Medical Insurance: The workmen’s compensation Act.
- Society and the General Practitioner: The implications of alternative remedies.
- Adolescent Health.

8. Radiology

Radiology as a medical discipline cuts across all aspects of medicine. Therefore, the importance of its full integration into the undergraduate curriculum cannot be over emphasized.

Pre-Clinical teaching of radiology should be encouraged right from the onset of training. At this level, a brief knowledge of the production of x-rays should be gained by the student and emphasis should be laid on basic radiological anatomy. Radiological anatomy should be taught side by side with gross anatomy.

Table 6:3

Instruction in Radiological Anatomy

<i>Gross Anatomy</i>	<i>Radiological Anatomy</i>
Musculoskeletal System	As demonstrated on plain X-rays e.g Skull,
Spines, Humerus, etc	Cervical
Vascular System	Angiography
Neuroanatomy	As shown on normal CT Scan.
Gastro-intestinal Tract	As shown in Barium Swallow, Barium Meal and Follow Through.
Genitourinary Tract	As shown in Intravenous Urography (IVU), Hysterosalpingography, Ultrasonography

During the introductory course at the commencement of the clinical years, students should have instruction on:

- The principles of x-ray production and image formulation;
- An overview emphasizing the usefulness and comprehensive nature of the use of Radiology in Medicine.

The physiological basis of procedures in radiology should be stressed during lectures in physiology e.g. physiological basis of IVU (glomerular filtration *etc*), oral cholecystography, *etc*.

During 2nd M.B. finals (first professional examination), examination in radiology should be limited to radiological anatomy, which can be part of the oral and/or steeple-chase portion of the examinations e.g. a plain radiograph of the chest could be mounted on a viewing box and a marker placed on any structure for identification.

Clinical Stage

Introductory lectures at clinical level should cover areas such as x-rays production techniques and indications for various radiological procedures.

Each block posting during the students clinical years may start or end with radiology, with emphasis on the radiology of the discipline as shown in Table 6:4

Table 6:4
Instruction in Radiology as Part of Clinical Rotations

<i>Posting</i>	<i>Radiological Aspect</i>	<i>Duration</i>	
Paediatrics Radiology			Paediatric 1 week
Medicine Emergency		2 weeks	Radiology of Routine & Medical
Cases Surgery Routine & Emergency			Radiology of
	Surgical Cases		
Obstetrics & Gynaecology			Pelvic Ultrasound, Pelvic x-rays, HSG <i>etc</i>
	1 week		

Students shall be instructed on current problems in film reporting and will be exposed to the basics of special examinations such as, I.V.U. Barium studies, CT Scan and Ultrasound.

An end of posting test which shall form part of the students' continuous assessment should be given.

At final examinations, a question or two should be incorporated in to each of the major papers. Film viewing sessions should form a prominent feature in oral examinations, in order to assess the clinical and practical acumen of the students.

Course of Instruction

- Introduction/Production of X-ray and Film Processing
- Gastro intestinal tract radiology
- Liver, biliary tract, pancreatic radiology
- Chest X-ray: basic concepts.
- Chest X-ray: pathologies
- Neuro-radiology
- Urinary tract radiology
- Cardiovascular radiology
- Radiology in Obstetrics and Gynaecology
- Principles of Ultrasonography
- X-ray of head and neck

Specific Course Objectives

It is expected that by the end of the undergraduate period, the student should

- Have acquired the ability to approach with confidence, the reading of a Chest X-ray, which is the single most basic principle. He should be able to identify
 - gross changes in the lung fields *e.g.* pneumonias, lung collapse, fibrosis, cannon-ball secondaries, pneumothorax, pleural fluid collection, acute pulmonary oedema and the various presentations of tuberculosis;
 - cardiac contour *e.g.* right and/or left-sided cardiac enlargement, atrial enlargement, aortic arch unfolding, aortic aneurysm, *etc.*
 - rib fractures; rib changes in rickets,
 - soft tissue change in the chest wall.
- Be able to detect not only gross fractures, but the not so obvious greenstick fractures of childhood, which occur most commonly and will come to him as a casualty officer
- Be able to review a plain X-ray of the abdomen and recognize: Normal bowel distribution pattern; evidence of a pneumoperitoneum, bowel perforation, normal and enlarged liver, spleen and kidney; Various forms of bowel obstruction such as Upper small bowel obstruction; Mid small bowel obstruction; Distal small bowel obstruction, Distal colonic obstruction; Mid-colonic obstruction; Proximal colonic obstruction
- Be able to identify: Radio-opaque gall stones, ureteric calculi and bladder stones; Parasitic calcifications.
- Be able to recognize -degenerative changes in the spine, vertebral collapse; paravertebral abscesses
- Be able to assess contrast examinations for gross pathology including fluoroscopy *e.g.*:
 - Barium Meal
 - Barium Enema

- Intravenous Urography.
- Cholecystography and Cholangiography.
- Cystourethrography
- Urethrography
- Myelography
- Ventriculography, Cerebral Angiography
- Arteriography
- Aortography
- Hysterosalpingography
- Be able to appreciate the use of radioisotopes in Radiology
- Be conversant with radiological examination of the extremities
 - Normal radiological anatomy of the upper and lower extremities, the thorax, the spine and the pelvic girdle.
 - Appearance of ossification centres and bone age determination.
- Be familiar with radiological anatomy of the skull as seen in the following projections:
 - Anteroposterior
 - Lateral
 - Towne's
 - Submentovertical (SMV)
 - Occipitomenital
- Be aware of ultra-modern imaging techniques – computer tomography, magnetic resonance imaging, positron emission tomography
- Understand the principles of interventional radiology
- Understand the principles of international radiography and teleradiography
- Have a basic knowledge of the use of radiotherapy in the treatment of malignant disease

The student should be taught the importance of filling a request form for radiological examination adequately. He should not only know what to ask for, but also the appropriate sequence of requests till radiological examination is concluded.

9. Pharmacology, Applied Pharmacology and Therapeutics

Aims and Objectives of Course

General

- To introduce the medical students to the principles of drug treatment in diseased states
- To impart knowledge of the understanding of properties of drugs and the mechanisms by which they produce their effects in diseased conditions.
- To enable the medical students at the end of the course to be competent to select drug(s) rationally for any ailment diagnosed on a scientific basis.
- To acquaint students with the National Drug Formulary and the Essential Drugs List Decree of 1989.
- To acquaint student with the "Guide to Good Prescribing" book produced by WHO.

Specific

At the end of the course, the student should be able to

- utilize the knowledge acquired to prescribe drugs or remedies for diseased states in man
- understand the pathological condition or altered physiological state from his knowledge of pathology and other clinical sciences
- prescribe appropriate drugs from his knowledge of pharmacology

Duration of Course

Instruction in pharmacology and applied pharmacology should be over a period of two academic years after the students have finished their studies in Anatomy, Physiology and Biochemistry. The course should be so organized that the students are gradually exposed to the study of drugs used in different disease states, as they progress through their clinical postings and have opportunity to see patients and study their management. This period may be divided into one academic year of basic principles of drug use in man and experimental animals followed by another year of clinical pharmacology during the rotation through the clinical and Community Health departments.

Course Content

The course should aim at providing the students with basic knowledge of drug action and extension of this knowledge to drug therapy. Systemic pharmacology should include wide areas of selected topics in different systems and organs.

Topics for Instruction (Lectures, Tutorials & Practicals)

1. General Pharmacology

The Scope of Pharmacology; Origin and Sources of Drugs; Routes of Administration of Drugs; Pharmacokinetics, Absorption of Drugs, Distribution of Drugs; Biotransformation of Drugs; Excretion of Drugs; Clearance and Half life of Drugs; Modes of Action of Drugs in Man; Compliance/Adherence Issues; Individual Variations; Interactions with other Drugs Concurrently or Previously Administered; Genetic Effects; Tolerance and Tachyphylaxis; Effects of Diseases; Drug Toxicity; Adverse Drug Reactions; Drug Dependence.

2. Neurohumoral Transmission

Review of Neurohumoral Transmission: Transmitters in the Central and Peripheral Nervous Systems; Cholinergic and Adrenergic Receptors; Cholinergic Agonists and Antagonists; Adrenergic Stimulants and Blocking Agents; Autacoids – Histamine Receptors and Histamine Antagonists: 5-hydroxytryptamine, Renin-Angiotensin; Kinins-Bradykinin-Kallikrein; Substance P, Prostaglandins; Leukotrienes; Cyclic Adenosine Monophosphate (c-AMP) and other mediators.

3. Systemic Pharmacology

- Drugs Acting on the Alimentary System - Vomiting-Antiemetics; Constipation-Purgatives, Ulcer Healing Drugs; Gastrointestinal Hormones-Pentagastrin, Secretin, Non-specific Antidiarrhoeal Drugs; Lactulose, Lipid Disorders-Cholestyramine; Pancreatin: Cholecystokinin
- Drugs Acting on the Respiratory System - Oxygen Therapy; Bronchodilators; Asthma and Status Asthmaticus, Cough Suppressants; Mucolytic Agents; Respiratory Stimulants

- Drugs Acting on Blood-Forming Organs - Anaemia; Iron Deficiency and other Hypochromic Anaemias; Megaloblastic Anaemia; Iron; Cobalamins; Folates; Anticoagulants; Heparin; Coumarins; Indanediones; Fibrinolysis - Fibrinolysin; Thrombus; Platelet Aggregation Inhibitors; Blood Lipid-Lowering Drugs
- Drugs Acting on the Cardiovascular System - Heart Failure and its Drug Management, Anti-Anginal Drugs; Ischaemic Heart Disease and its Drug Management; Antiarrhythmic Drugs; Hypertension and its Drug Management; Vasodilators
- Drugs Acting on the Urinary System - Diuretics; Alteration of Urine pH; Urinary Tract Infections; Renal Failure; Immunity and Immuno-suppressive Agents
- Antimicrobial, Antifungal and Antiviral Drugs and Drugs Against Protozoal Diseases-
 - Sulphonamides;
 - Antibiotics: Penicillins; Cephalosporins; Aminoglycosides; Lincomycin; Peptide Antibiotics; Drug Treatment of Tuberculosis; Miscellaneous Antibiotics: Vancomycin, Spectinomycin, Fusidic Acid, Other Synthetic Antimicrobial Drugs; Nalidixic Acid; Nitrofurantion; Drug Treatment of Leprosy
 - Antifungal Agents: Polyene Antifungal Antibiotics; Imidazoles; Miscellaneous Antifungal Agents
 - Antiviral Agents: Methiasazone; Idoxuridine, Cytarabine, Adenine Arabinoside, Interferons; Humoral Immunoglobulins *etc.*
 - Drug Therapy of Malaria, Amoebiasis, Amoebic Liver Abscess, Trypanosomiasis, Leishmaniasis, Giardiasis, Trichomoniasis, Ancylostomiasis; Ascariasis; Trichuriasis; Strongyloidiasis; Enterobiasis; Trichinosis, Filariasis, Loiasis, Onchocerciasis; Dracontiasis; Schistosomiasis; Fasciolopsis, Clonorchiasis; Paragonimiasis; Taeniasis; Cystecercosis; Hydatid Disease; Diphyllobothriasis.
- Chemotherapy of Malignant Disease - Major Features of Malignant Diseases; Review of Cell Kinetics, Cell-Cycle Specificity; Cell-Cycle Non-Specificity; Cancer Cell versus Bacterial Infection;
- Principles of Cancer Chemotherapy; Adverse Effects of Antineoplastic Drugs; Alkylating Agents; Anti-metabolites: Purines and Pyrimidines analogues; Natural products; Anthracycline Antibiotics; other Antibiotics; Enzymes; Steroid; Hormones and Antagonists, Miscellaneous Anti-cancer Drugs; Agents for Immunotherapy; Radioactive Drugs.
- Drugs Acting on the Central Nervous System - Special situations of Drug Action; Entry of Drugs into the CNS; Non-Narcotic Antagonists and Partial Agonists; Antipyretic Agents, Sleep; Barbiturates and Non-barbiturate Agents; Alcohol; Review of General and Local Anaesthetic Drugs; Anaesthesia in persons already taking drugs; Neuromuscular Blocking Agents; Central Nervous System Stimulants; Anticonvulsant Drugs; Epilepsy; Principles of Antiepileptic Treatment; Review of Different groups of Antiepileptic Drugs; Status Epilepticus; Epilepsy and Special Situations - Pregnancy, Contraception, Anaesthesia, Surgery; Miscellaneous Anticonvulsant Drugs; Drug Treatment of Parkinsonism; Levodopa; Dopa Decarboxylase Inhibitors; Bromocriptine; Amantadine, Anticholinergics; Anthihistaminics; Phenothiazines, Drug Therapy of Spasticity; Dantrolene, Baclofen, Interneuronal Blockers; Drugs in Myasthenia Gravis; Drugs in Migraine.

- Drugs in Mental and Mood Disorders - Antipsychotics: Phenothiazines Thioxanthenes; Butyrophenones; Rauwolfia Alkaloids; Antidepressants: Monoamine Oxidase Inhibitors (Hydrazine and Non-hydrazine); Tricyclics; Tetracyclics; selective serotonin Reuptake Inhibitors; Antimanic-Dibenzazepines; Lithium; Anxiolytics- Benzodiazepines; Pyrimidylbutyldione;
- Drug Treatment of Joint Diseases - Inflammatory Arthropathy and Degenerative joint Disease; Metabolic Disposition Arthropathy; Analgesics; Non-steroidal Anti-inflammatory Drugs (NSAIDS); Corticosteroids, Long-term Anti-rheumatic Agents; Gold Salts, d-Penicillamine; Chloroquine; Immunosuppressive Agents; Levamisole; Gout: Colchicine; Indomethacin, Probenecid; Sulphinpyrazone; Allopurinol.
- Pharmacology of the Endocrine System - Mechanisms of Action of Hormones, CNS-Hypothalamus-Adenohypophysis-Endocrine Glands; Anterior and Posterior Pituitary Hormones, Thyroid Hormones and Antithyroid Drugs. Parathyroid Hormones; Thyrocalcitonin; Diabetes Mellitus; Insulin; Oral Antiglycaemics; Adrenocortical Hormones; Glucocorticoids; Mineralocorticoids; Hyperaldosteronism; Sex Hormones: Oestrogens; Androgens; Progestogens; Antagonists to Hormones.
- Drugs in Obstetrics and Gynaecology - Drugs in Pregnancy, Drugs affecting Uterine Motility; Ergot Alkaloids; Oxytocin, Prostaglandins; Tocolytic Drugs- β_2 Adrenoceptor stimulants; Pharmacological Methods of Family Planning
- Drugs Acting on the Skin - General Aspects of Dermal Pharmacokinetics; Forms of Topical Application and Systemic Administration in Dermal Conditions; Topical Antifungal and Steroid Preparations and their Adverse Effects

4. Pharmacoepidemiology and Pharmacoconomics

Essential Drugs List and Essential Drugs Programme; Rational Drug Use: Guide to Good Prescribing; Management of Drug supplies; Drug Revolving fund and user fees and how to recover costs that should have been paid by statutory exemptions; Drug utilization Monitoring by periodic Audit surveys.

5. Practical Classes/Demonstrations

A reasonable number of practical classes and demonstrations should be organized to make the students understand the nature of drug action and how drugs can affect organ systems, e.g. Heart, Kidneys, Respiratory and Vascular Systems.

10. Sciences of Pathology

Aims and Objectives

A thorough understanding and application of the knowledge of Pathology, as a medical discipline, is a veritable foundation for acquiring good medical education. The aim of this course therefore is to inculcate this knowledge in the medical graduate.

Scope of the Course

The scope of subjects to be covered during the course of medical training is extensive and should include the following sub-disciplines:

- Morbid Anatomy and Forensic Pathology
- Post Mortem Examinations
- Bacteriological Examinations

- Parasitology
- Virology
- Serology
- Immunology
- Haematology and Blood Transfusion
- Chemical Pathology
- Clinical Pathology

Instructional Methods

The undergraduate lectures, tutorials and practical training should be effectively carried out in departments of Clinical Pathology (including bacteriology and virology) and of Haematology and Blood Transfusion.

The teaching/learning experience should be integrated with introductory tutorials and bed-side clinical instruction in Medicine and Surgery; Obstetrics and Gynaecology; and Paediatrics.

Undergraduate medical students should watch and participate in Post Mortem Examinations. They are expected to learn the technique of performing autopsy safely and should be taught the important ethical considerations involved. They should be trained to provide the explanations needed in the strengthening of the confidence of the deceased's relatives, so as to obtain the "Permission for Conducting Post Mortems".

The undergraduate medical student should also be taught the reasons for the legal requirement for conducting "Coroner's Post-Mortem Examination" in most cases of sudden deaths *etc.* This is an important overlap to their training in "Medical Jurisprudence and Toxicology"

The course of instruction in clinical pathology, haematology and blood transfusion should last through the first eighteen to twenty four months of clinical training after which they will be examined in the subject. Even after the formal examination, the students will be expected to continue to learn clinical pathology in the context of their final clinical rotations where they will be expected to attend the clinic-pathological conferences organized jointly by the clinical pathology and the core clinical departments

Examinations, which should be held at the end of the course of training, should comprise written, practical and oral formats, and for the medical student to satisfy the examiners, he/she must score a minimum of 50%.

Provisions for re-sit examination should be available within 3 months of the initial examination.

10.1 Chemical Pathology

Course Content

Introductory

- Quality Assurance, Quality Controls, Precision and Accuracy in the Laboratory

- Collection, Preservation and Processing of Specimens
- Factors affecting Laboratory Results.
- Reference values and their distribution
- Urinalysis (Principles, performance and interpretation)
- Fluid and Electrolyte Balance and Disorders(Demonstration of Flame Photometer and Ion Selective electrodes)
- Acid-Base Balance and Disorders
- Blood glucose homeostasis.
- Examination of the cerebrospinal fluid

Intermediate

- Glucose in body fluids; Methods of determination in urine, CSF and blood with interpretation of results; Glucose Tolerance Test (GTT) and interpretation
- Protein in body fluids; Methods of determination in urine, CSF and blood with interpretation of results; urine and serum albumin estimation; urine, CSF and serum electrophoresis and interpretation; urine and serum pre-albumin estimation
- Principles of Chromatography; Paper and thin layer chromatography; Other types of chromatography
- Enzymes in the Diagnosis of Diseases: Cardiac, Liver, Pancreatic, Skeletal Muscle, Prostate, Genetic diseases; use of enzymes as labels and reagents
- Metabolism of Calcium, Inorganic Phosphorous and Magnesium; Disorders of these
- Biochemical markers of Bone and Metabolic Bone Diseases
- Inborn Errors of Metabolism
- Bilirubin metabolism and Tests of Liver Function
- Tests of Renal Function
- Tests of Gastrointestinal function and Malabsorption Syndrome
- Definition and classification of anaemias.
- Water and Electrolyte Balance I
- Water and Electrolyte Balance II
- Acid-Base Balance.
- Iron metabolism and Iron deficiency Anaemia.
- Iron overload and sideroblastic Anaemia.
- Folate and Vitamin B12 Metabolism.
- Megaloblastic Anaemias.
- Renal function Tests.
- Acute and Chronic Renal Failure.
- Disorders of Carbohydrate Metabolism.
- Glucose homeostasis, Diabetes Mellitus and Metabolic syndrome
- Laboratory Diagnosis of Diabetes Mellitus.

Advanced (Final Block Posting)

- Serum protein and disorders
- Lipid and Lipoproteins and disorders
- Trace elements and disorders
- Vitamins and disorders
- Dietary Fibres

- Disorders of over-nutrition (Obesity, hyperuricaemia and gout)
- Disorders of under-nutrition (Marasmus and Kwashiorkor)
- Introduction to Endocrinology
- Hypothalamus and Pituitary
- Disorders of Thyroid axis
- Disorders of Adrenal axis
- Disorders of Gonadal axis
- Chemical Pathology of Pregnancy
- Chemical Pathology of Hypertension
- Biochemical tumour markers and Chemical Pathology of Neoplasia
- Demonstration of the Assay of each Analyte in the Chemical Pathology Laboratory.

10.2 Haematology and Blood Transfusion

Course Content

Introductory

- Specimen collection, preservation and processing
- Anticoagulants, preservatives and buffers
- Reference values
- Estimation of Haemoglobin and packed cell volume
- Red blood count and calculation of red blood cell indices
- Total white blood cell count and differential
- Platelet count
- Blood film preparation and examination of blood films
- Erythrocytic Sedimentation Rate (ESR)
- Reticulocyte count
- Sickling test and solubility test
- Quality Assurance and Quality control

Intermediate

- Development, morphology and function of red blood cells
- Development, morphology and function of white blood cells
- Platelets: development, morphology and function
- Definition and Classification of Anaemias
- Iron Metabolism and Iron Deficiency Anaemia
- Iron Overload and Sideroblastic Anaemia
- Folate and Vitamin B12 metabolism
- Megaloblastic Anaemia
- Haemolytic Anaemias (classification and management)
- Anaemia Associated with Systemic Disorders
- Structure, Function and Control of Synthesis of Normal Haemoglobin.
- Haemoglobinopathies and Hb electrophoresis
- Structural Abnormalities; Sickle Cell Disease; Thalassaemias
- Genetic Counselling and Antenatal Diagnosis of Haemoglobinopathies.
- Pancytopenias and Aplastic Anaemias
- Leukaemias (Aetiology and Classification); Acute Leukaemias; Chronic Leukaemias

- Classification, Clinical Presentation and Laboratory Diagnosis of Haemolytic Anaemia
- Intracorporeal and Extracorporeal Defects in Haemolytic Anaemia
- Immunoglobulins I; Immunoglobulins II
- Complement System
- Immunology: Clinical Aspects I; Immunology: Clinical Aspects II
- Autoimmunity and AIDs

Advanced (Final Block Posting)

- Blood groups, Red blood cell antigens and antibodies
- ABO and Rhesus grouping and cross-matching of blood
- Direct and indirect antiglobulin tests
- Screening of donor blood for HIV, HbsAg, HCV, VDRL
- Indications and complications of blood transfusion
- Haemolytic diseases of the newborn
- Normal haemostasis
- Investigation of bleeding disorders
- Vascular and platelet disorders
- Inherited coagulation disorders; Acquired coagulation disorders
- Thrombosis (aetiology and management)
- Lymphomas (Burkitt's, Hodgkin's and non-Hodgkin's)
- Myeloproliferative disorders
- Multiple myeloma and paraproteinaemias
- Splenomegaly and tropical splenomegaly syndrome

10.3 Immunology

Course Content

Introductory

- Development, Morphology and function of Lymphocytes
- The CD classification of human lymphocyte differentiation antigens
- The structure and function of immunoglobulins
- The immune system
- The complement system
- The cytokines
- Serology, vaccines and immunization
- Screening tests for HIV and other autoimmune diseases
- Principles of immunological techniques

Intermediate

- Mechanism of immune mediated damage to microbes or host tissue
- Allergies, Anaphylaxis, Urticaria and angioedema
- Systemic mastocytosis
- The major histocompatibility gene complex (HLA complex and its products)
- Autoimmunity
- Primary immune deficiency disease; Secondary immune deficiency disease
- Human Immunodeficiency Virus (HIV)
- Acquired Immunodeficiency Syndrome (AIDS) and related disorders.

Advanced (Final Block Posting)

- The Spleen; Hypersplenomegaly and Tropical Splenomegaly syndrome (TSS)
- Systemic Lupus Erythematosus (SLE); Rheumatoid arthritis; Scleroderma;
- Sjogren's syndrome; Ankylosing spondylitis; Sarcoidosis

10.4 Medical Microbiology and Parasitology

Course Content

1. Infectious Organisms

- Gram positive cocci: *Staphylococcus* and *Streptococcus*
- Gram negative cocci: *Neisseria* etc
- Gram positive bacilli: *Corynebacteria*, *Listeria*, etc
- Gram negative bacilli; *Enterobacteriaceae* (Lactose and non-lactose fermenters)
- Bacterial Diarrhoeal Diseases
- Typhoid and other septicaemias
- Malaria; Parasitic Blood infections.
- Intestinal Parasitic infections; Intestinal Round Worm infections
- Tissue Round worm infections; Myiasis
- Chlamydial and Rickettsial Infections
- Venereology
- Zoonosis
- Mycobacterial infections
- Polio and other enteroviruses
- Yellow fever and other haemorrhagic fevers
- Hepatitis Viruses
- Immunity, Infections and Immunodeficiency
- Serological Diagnosis of infections

2. Systemic Infections/Hospital Acquired Infections

- Urinary Tract infections
- Central Nervous System Infections
- Soft Tissue Infections
- Endocarditis and Septicaemia
- Respiratory Tract Infections
- Opportunistic Infections; Control of Hospital Acquired Infections
- Principles of Chemotherapy
- Fungal Infection: dermatophytes, yeasts, dimorphic fungi, dermatititious fungi
- Amoebiasis; Tapeworm Infection; Schistosomiasis.
- Orthomyxoviridae; Paramyxoviruses; Rhabdoviridae and other Zoonotic Viruses
- Herpes Viruses
- Retroviruses (HIV/AIDS; HTLV)

10.5 Anatomical Pathology (Histopathology)

Course Content

1. Introductory (General Pathology)

- Introduction to Pathology; Role of Autopsy

- Normal Cell, Causes of Injury; Cellular Adaptation; Cell Death
- Body Reaction to Injury; Tissue Healing and Repair
- Disturbances of Haemodynamics
- Genetic Basis of Diseases
- Cell Growth and Proliferation Mechanisms
- Neoplasia: Mechanism of Carcinogenesis and Tumour Biology; Metastasis; Classification of Tumours
- Disorders of Nutrition

2. Intermediate (Systemic Pathology)

- Cardiovascular System - Rheumatic Heart Disease, Endocarditis, Hypertension, Cardiomyopathies, Ischaemic Heart Disease, Disease of Blood Vessels
- Central Nervous System - Congenital, Inflammatory and Vascular Lesions, Tumours, Degenerative Disease
- Alimentary System - Oesophagus, Stomach, Pancreas; Small and Large Intestine; Cancer of the Colon; Hepatobiliary System
- Endocrine System - Disease of Pituitary, Adrenals, Thyroid and Parathyroid
- Diseases of the Male and Female Reproductive Organs
- Respiratory System - Pneumonias, Lung Abscess, Bronchiectasis, Tuberculosis, Chronic Obstructive Lung Disease, Pneumoconiosis and Lung Cancer
- Musculoskeletal System - Infections and Tumour
- Haemoglobinopathies
- Disease of the Skin: Leprosy, Buruli Ulcer, Deep Mycoses
- Disease of the Head and Neck including intraocular tumours
- Urinary System - Congenital Diseases of the Kidney, Renal Failure; Glomerulopathies and Nephrotic Syndrome, Pyelonephritis and Diseases of the Bladder
- Lymphoreticular System I - Lymphomas and other causes of Lymphadenopathy
- Lymphoreticular system II - Malaria and Tropical Splenomegaly Syndrome
- Specific Infections, Typhoid; Schistosomiasis

3. Advanced (Final Block Posting)

- General Pathology - Mechanisms of Cellular Injury & Cell Death; Molecular Events in Cell Growth; Control of Cell Growth; Oncogenesis and Tumour Biology; Role of MHC in Disease and Mechanisms of Autoimmune Disease; Acquired Immune Deficiency States including AIDS; Genetic Basis of Disease and the Role of Molecular Biology in Diagnosis of Disease
- Specific Disease Pathology - Malignant Lymphoma; Tumours of the Breast and Cervix: Epidemiology and Role of Screening; Nephrotic Syndrome and Glomerulonephritis; Cardiovascular Disease *e.g.* Rheumatic Heart Disease, Hypertension, Cardiomyopathies
- Tropical & Infectious Disease Pathology – Tuberculosis; Schistosomiasis; Trypanosomiasis; Typhoid Fever, Amoebiasis *etc...*
- Practicals and Autopsy Demonstrations (including slides and Pots)

10.6 Forensic Medicine

Course Content

- Introduction to Forensic Medicine - History, Definition *etc*
- Medico-legal system – Medical examination/coroner's cases
- Medical and Dental Council of Nigeria.
- Medical Defense Unions.
- The doctor's duty at the scene of death (natural and un-natural)
- Signs of death- estimation of the time of death.
- Identification.
- The Medico-Legal aspects of blood.
- Sudden and unexpected death.
- Circumstances and treatment of poisoning including investigations of death due to poisoning.
- Some legal poisons.
- Types of wounds – bruised, abrasion, lacerations, incisions, cut-throat and stab wounds.
- Injuries in road traffic accidents.
- Firearms and firearm wounds.
- Asphyxia – hanging, strangulations, suffocation *etc*.
- Drowning, Burns, Electrocution, Deaths from Lightning
- Consent, Professional secrecy, medical negligence
- Writing a medico-legal report, the doctor in court; the coroner, and his duties.
- Alcohol abuse.

11. Medical Ethics and Jurisprudence

Objectives

The course should familiarize students with the following:

- Major codes of ethics relevant to Medicine viz the Hippocratic Oath, The Physicians Oath or Geneva Declaration (1948, 1968)
- The Declaration of Helsinki (1964, 1975).
- The Medical and Dental Practitioners Decree No. 23 of 1988.
- The Medical and Dental Council Regulations for Professional Conduct and the National Health Policy
- The Relationship between Law and Medical Ethics and especially the concept of confidentiality and third party payment
- The appropriate doctor-patient and doctor-colleague relationship
- The principle of informed consent.
- Nigerian social and cultural values and medical ethics.
- Guidelines for counselling on such issues as eugenics, contraception, abortion, sterilization, infertility, impotence, deformity, suicide, dying, euthanasia, physician assisted suicide *etc*.
- The Responsibility of Doctors to Society.
- The Responsibilities of Medical Ethics Committees.
- Procedures for appearing in court.
- Involuntary treatment of mental disturbance and social control of deviance.
- Concept of professional negligence and infamous conduct in a professional respect.

- Peer review.
- Medical audit.
- Human rights advocacy.

Instructional Methods

Teaching of medical ethics should start with the teaching of medical history during the first year of pre-clinical studies. From then on ethics should be taught throughout the period of training until graduation. Ethics should be taught on a multi-disciplinary basis. Methods to be used include *Modelling, Lectures, Case Studies, Tutorials and Seminars*.

At some stage there must be an examination which must be passed by all students before graduation

Lectures

There should be at least 10 hours of lectures during the course, covering:

- Principles of the philosophical basis of moral discourse.
- Ethics and Morals.
- Theories of justice.
- Concepts of right and duty.
- History and philosophy of medical ethics.
- The codes of Medical Ethics and relevant national law.
- Relationship between Religion and Medical ethics.
- Influence of socio-cultural values on medical ethics.
- Confidentiality.
- Informed consent and the right to refuse treatment.
- Resource allocation and determination of priorities; patient selection.
- Ethical aspects of drug treatment.
- Doctor-patient, Doctor-doctor, doctor-medical team relationships.
- Ethical aspects of withdrawal of care and participation in civic disobedience.
- Medical Ethics and fundamental human rights.
- Peer review and medical audit.
- Ethical issues involved in Primary Health Care.
- Ethics of Dental Practice.
- Ethical aspects of sexuality, contraception, abortion, assisted reproduction and sex change operations.
- Medical Ethics and private medical practice.
- Psychiatric aspects of medical ethics – interview, research, involuntary committal and treatment, labelling and stigma, insanity, plea, sex therapy, appearing in court, testamentary capacity, abuse of psychiatry etc.
- Ethics of Organ transplant and genetic engineering.
- Stages of dying and diagnosis of death.
- Ethics and prenatal diagnosis of genetic disorders.
- Ethics and modern developments in medical science: cloning, genomics, telemedicine, assisted conception, etc.
- Ethics and the development of National Health policies.
- Ethics and the implementation of National Health Plans.

- Ethics, managed care, and Health Insurance Schemes.
- Medical documentation and medical ethics.
- Socio-economic factors and ethical practice in an underdeveloped society.

Practical Community Health Experience

Students should be exposed to at least 2 months practical experience of working in the field in the community to learn the strategies for Primary Health Care Delivery to such a community

Training in Management and Educational Methods

For reasons which had been stated earlier, a good knowledge of the basic principles and practice of Management, Educational Methods and Educational Technology should form part of the undergraduate curriculum.

Length of Medical Training

The minimum length of time which a student can spend on the course should be six academic sessions for those entering with the UTME, five academic sessions for those with direct entry qualifications and a minimum of 190 weeks of instruction for those admitted to 4-year post-baccalaureate programmes that are approved by Council. In general courses of instruction and methods of assessment of student performance must lay emphasis on problem solving and practical skills required for the practice of medicine, and not mere recall, in keeping with the requirement for the young graduate to be able to assume independent responsibility soon after graduation.

PART THREE

MINIMUM STANDARDS FOR DENTAL EDUCATION

CHAPTER 7

BASIC REQUIREMENTS FOR DENTAL EDUCATION

Council recognizes that the curriculum of a dental school is normally designed and produced by the Board of Studies (or an equivalent body) of that school, subject to the approval of the appropriate University organ such as the University Senate. It is however the duty of the Medical and Dental Council to satisfy itself that the knowledge, skill and attitude derived from such a curriculum meet the minimum standards required by Council before recognition can be accorded to the professional qualifications obtained after undertaking the prescribed courses of this curriculum.

The nomenclature for the degree programme in Dental Surgery shall be specified by the institution either as a Bachelor of Dental Surgery or, for institutions with approval from Council to run four-year post-baccalaureate programmes, Doctor of Dental Surgery.

Selection of Students

In practice, more often than not, the decision on the minimum level of general education required of students wishing to enter dental schools is not optimally related to the dental school curriculum, but to the general format of secondary school education in the country. This period of education should provide students with the foundation to undertake the biological and physical sciences of the dental curriculum.

The following secondary school subjects are deemed prerequisite to dental education: Biology: Physics: Chemistry: Mathematics and English.

Prospective dental students must pass the West African School Certificate or the Senior Secondary School Certificate Examination or any equivalent examination, with at least Credit level passes in the above five subjects.

Admission Requirements

For admission into undergraduate dental education programmes, the candidates must, in addition to fulfilling the criteria stated above, be successful in the Unified Tertiary Matriculation Examination (UTME) or obtain three principal passes in Biology, Chemistry and either Physics or mathematics at the General Certificate of Education Advanced Level Examinations.

For admission into approved post baccalaureate 4-year programmes, applicants must obtain a university degree not below 2nd class lower division in the biomedical, biological, chemical or physical sciences, provided such a course of study included specific courses as may be listed in the *Guidelines on Minimum Standards of Medical and Dental Education in Nigeria* ('the Red Book') and other publications of Council from time to time. Only candidates who had credits at SSSC level in English, Mathematics, Physics, Chemistry and Biology would be eligible. The candidates must have offered and passed courses at undergraduate level in the following:

Physics including Mechanics, Thermodynamics, Optics, Basic Principles of Electromagnetism

Chemistry including Physical Chemistry, Organic Chemistry, Inorganic Chemistry and Chemical Thermodynamics

Biological or Life Sciences including General Mammalian Anatomy and Physiology (Human or Animal) covering the Musculoskeletal, Haemopoietic & Haemostatic, Immunological, Neurological, Cardiovascular, Renal, Endocrine and Gastrointestinal Systems); Psychology (Human Psychology and Basic Human Behaviour); General Biochemistry (including protein chemistry and the chemistry of other biomolecules, cellular metabolism and molecular biology); at least one of a selection of courses in microbiology, genetics, molecular genetics/biology, neuroscience, nutritional sciences, pharmacology, toxicology, botany, biology or zoology.

The selection of the students should take into consideration the academic performance of candidates vis-à-vis the requirements of the future practitioners of dentistry.

Interviews are strongly recommended in the selection of candidates to the dental programme in order to determine each candidate's aptitude and suitability.

A minimum of 10 and a maximum of 30 annual intake of students are recommended, provided the admitting Institutions can cope in terms of academic staffing and infrastructural provisions.

Curriculum Planning

The planning and evaluation should be designed in such a way that there should be clear-cut objectives which must be evident and should be evaluated from time to time.

Course Unit System

Examination by Course Unit System is not considered feasible under the present condition and so should not be made compulsory. This book of guidelines does not encourage the use of the credit unit system.

Duration of Course

The minimum length of time which a student can spend on the course should be six academic sessions for those entering with the UTME, five academic sessions for those with direct entry qualifications and a minimum of 190 weeks of instruction for those admitted to 4-year post-baccalaureate programmes that are approved by Council.

CHAPTER 8

FACILITIES REQUIRED FOR DENTAL TRAINING

An institution that proposes to commence training in Dental Surgery would be expected to have the basic facilities described in Chapter 2 of this book of guidelines as it is expected that a Dental School would be affiliated with a full-fledged teaching hospital. In addition, the peculiar requirements of dental training demands that the additional physical facilities and personnel described in this chapter be made available.

Academic Physical Facilities

The standard of training given in a Faculty of Dentistry depends, among other factors, on the availability of physical facilities specifically designed and built for dentistry.

Office Accommodation for Academic Staff and Other Personnel

The minimum should consist of:

- The Dean's Office Complex
- Office accommodation for each head of department and supporting staff
- Office accommodation and research laboratory facilities for each member of staff
- Chief Dental Nursing Officer's Office
- Equipment Maintenance Technicians' Office
- Academic Staff Common Room
- Non-Academic Staff Common Room
- Students' Common Room
- Changing Rooms for Students, Nurses, and Dental Surgery Assistants

Lecture/Seminar Rooms

There should be at least one lecture theatre or auditorium on the campus, large enough to accommodate 250 students at the same time. It is possible that some of these facilities may exist within a College of Health Sciences, and be shared with another Faculty such as the School of Medicine.

In addition to the lecture theatre/auditorium mentioned above, a minimum of 3 lecture halls, each large enough to accommodate a minimum of 30 students are mandatory.

In principle, it is suggested that the design of school buildings should be carried out with the greatest reasonable flexibility; tomorrow's needs may be quite different from today's.

Research Laboratory

It is desirable to have a common research laboratory for academic staff in the School of Dentistry. This is however not mandatory.

Teaching Laboratories

Special laboratory space of about 60 sq. metres, including ancillary rooms, is needed to meet the demands of training students in dental technology. There should be one teaching laboratory fully equipped for prosthetics and another for Crown and Bridge. The

requirement of such a laboratory must meet the needs of the various cadres who will work there, such as:

- Lecturers in Prosthetics, Conservation, Orthodontics *etc*
- Dental Technology Instructors with expertise in different specialties.
- Dental Students at various levels of training
- Dental Technologists and auxiliary laboratory staff

It should be emphasized that the laboratory environment must facilitate the demonstration and observation of procedures.

General Facilities for Professional Training

The clinical facilities and requirements for professional training in dentistry are both extensive and expensive and to a large extent limited by the financial resources available. These facilities, a well-conceived curriculum and an adequate complement staff are all essential for a creating an environment conducive to learning. While variations of the facilities may occur from one institution to another, the minimum shall be the following:

- Dental Operatories
- Laboratories for the production of dental prostheses
- Laboratories for routine clinical investigations
- Radiological facilities
- Theatre facilities
- Instrument Storage
- Sterilization facilities
- Accidents and Emergencies Clinic
- In-patient beds
- Medical Records Department
- Pharmacy Unit for the Dental Hospital
- Phantom Head Operatories

Dental Operatories

These constitute the most important clinical facilities in a School of Dentistry. These operatories, equipped with instruments and materials, are used by the students for treatment of their patients, under the supervision of members of staff. The number of operatories should be such that there is one for two clinical students undergoing clerkship in each department.

The operatory, should normally be about 11.5 square metres, must be suitable for most types of operative procedures whether performed by left-or-right-handed operators, working alone or with assistants. It should also allow easy supervision of students by staff and be sufficiently roomy to allow free movement of staff and students.

Laboratories for Production of Dental Prostheses

There should be one production laboratory for prosthetics and another for Crown and Bridge.

Laboratory for Routine Clinical Investigations

There should be an adequately equipped Oral Pathology laboratory to carry out investigations relevant to dentistry.

Radiological Facilities

Adequate facilities for the teaching of the following radiological techniques to dental students should be provided:

- Intra-oral radiology
- Extra-oral radiography, particularly, those of head and neck
- Pantomography
- Cephalometry
- Radiography of chest and other parts of the body

These pieces of X-ray equipment must be housed in radiation protected rooms.

Theatre Facilities

There should be one theatre attached to the dental school for out-patient dental care under conscious sedation or general anaesthesia. There should also be a main theatre within the Teaching Hospital Complex for major oral and maxillofacial surgical operations.

Instruments Storage and Sterilization Facilities

There should be a main store to provide materials and instruments for the dental hospital. Sterilization of instruments can either be done centrally or in units. In either case, the necessary storage space, work-top space and accommodation sterilizers must be provided.

Accidents and Emergencies Clinic

Within the dental hospital, there should be an Accidents & Emergencies Unit which should be opened 24 hours.

In-Patient Beds

There should be a clearly defined ward-space for the in-patient management of dental and maxillofacial patients. The bed complement shall be such as to offer clinical teachers the facilities to teach hospital dentistry. Whilst it is realized that, ordinarily, the bed complement for a dental hospital is not very large, it is still important that the minimum complement be equitably distributed for male, female and paediatric occupancy.

Medical Records

The medical records are important for:

- Proper care of patients
- Research database
- Medico-legal reasons

The facilities should include a Records Department, which must be located within the dental hospital, and be manned by trained health records officers. The department must have a registration area, a filing section equipped with appropriate cabinets and racks, as well as a records library. Computerized records department will be preferable.

Pharmacy Unit

There should be a small pharmacy unit within the dental school, with a proper complement of registered pharmacists.

Students' Residential Accommodation

It is essential for students, during the clinical years, to be resident within the teaching hospital premises and in any case not farther than 2 kilometres from the teaching hospital so as to be able to function as part of a health care team.

Phantom Head Operatories

There should be one complete phantom head with accessories for each pre-clinical student (*i.e.* 25 – 30) for restorative procedures, to be arranged 5 to 6 per table in a well illuminated air-conditioned room.

General Infrastructure for a Dental School

Dental equipment are highly sensitive to fluctuations in voltage of electric power supply and to the presence of particles in water. They cannot function without the following:

- An uninterrupted supply of electricity of steady voltage
- Particle-free pipe-borne water with adequate pressure head

Therefore, a stand-by generator or as well as an adequate overhead water storage tank are mandatory.

Most items of dental equipment are powered by compressed air. The failure of a lone compressor would mean a complete paralysis of the operation of the dental hospital. Therefore, in the installation of dental operatories, there should be a functional stand-by compressor.

Since dentistry as a profession is equipment-intensive, it is mandatory to have a team of equipment technicians for routine maintenance of all the equipment.

Good access roads as well as internal and external communication facilities are necessary.

Specialized Equipment

Pre-Clinical Dentistry

Each student shall have one complete phantom head unit with its accessories for operative techniques. He shall also have for prosthetic techniques a Dental Motor with its hand piece and other accessories

Clinical Dentistry

There should be complete dental operatories with accessories; each clinical department shall have at least one dental operatory for two clinical dental students doing their clerkship in that department.

Research

Each department shall have a complete dental operatory for research.

Library and Information Resources

Since the effectiveness of teaching is very much dependent on active research, facilities for basic and clinical research are essential components of a Faculty of Dentistry.

There should be a well-equipped dental library, as part of an existing College of Medicine Library, with sufficient reading space and adequate supply of up-to-date journals,

periodicals and referenced textbooks. Audio-visual facilities as resource for learning may also be provided. Available floor space should be at least 150 sq. meters. In addition, there should be an adequate number of computers with internet facilities, access to literature search engines and CD-ROM. A Medical Librarian should head the facility.

Human Resources

Academic Staff

Academic staffing is a major and critical determinant for the achievement of high standard of training. It is a well-known fact, however, that suitably qualified academic staff in Dentistry are difficult to recruit as there is a world-wide shortage of such staff. Therefore, the staffing of a dental institution in Nigerian must be seen as one of the most serious problems the institution will face in an effort to achieve the minimum standard of education.

The solution to the problems of staff shortage is to expand the postgraduate facilities in all the existing institutions and to encourage suitable candidates to undertake their training in this country. It is thus obvious that the National Postgraduate Medical College training programme is the biggest potential source of staff development for the country.

The academic members of staff should possess recognized postgraduate qualification and adequate experience. The following categories of Academic Staff, with the minimum qualifications stated, are required for a Faculty/School of Dentistry:

Table 8:1

Categories of Staff	Qualifications
Lecturer Grade II	Medical and Dental Council registrable undergraduate dental degree (or equivalent, <i>e.g.</i> DDS) and success at the Part I Fellowship Examination of the FMCDs or FWACS or equivalent.
Lecturer Grade I (appointment with clinical responsibility)	Medical and Dental Council registrable undergraduate dental degree or equivalent (<i>e.g.</i> BDS, DDS, DMD, LDS, <i>etc</i>) plus MDCN registrable post-graduate qualification (<i>e.g.</i> FMCDs, FWACS, Fellowship of Royal College, UK and Ireland, Board Certification in USA, <i>etc</i>) which the Medical and Dental Council (MDCN) recognizes for appointment to consultant positions, subject to other approved regulations of the University concerned.
Lecturer Grade 1 (for teachers in Dental Anatomy/Dental Materials/Oral Biology and Physiology.	A good first degree and in addition, a Masters degree or Doctorate. Adequate publications, teaching and research, subject to other approved regulations of the university concerned
Senior Lecturer	At least three (3) years experience as a Lecturer Grade I. Evidence of research, publications and other approved regulations of the University concerned.
Associate Professor	Three (3) years of Senior Lectureship. Research ability and adequate teaching experience and other approved

	regulations of the University concerned.
Professor	At least ten (10) years university teaching experience with substantial publications, outstanding research, teaching and administrative ability in university service. The position can be filled either by promotion or appointment.

The academic members of staff should possess Council recognized post-graduate qualifications and adequate experience. Owing to the practical nature of dentistry, which requires extensive training in manipulative skills and operating on human subjects, an academic staff to students ratio of one to four (1:4) is recommended.

There shall be recognized teachers, full or part time, for each of the following major areas, constituting a minimum number of four core departments

- Oral and Maxillofacial Surgery
- Restorative Dentistry
- Preventive and Community Dentistry
- Child Dental Health

Basic Medical Science Teachers

In addition, there should be a minimum of one full time academic staff with professional qualifications registrable with the Medical & Dental Council of Nigeria in each of the three preclinical departments where Anatomy, Physiology and Biochemistry are taught.

Non Academic Staff

Dental Technologists

The dental technologist demonstrates parts of the laboratory techniques involved in conservative dentistry, prosthetics, oral and maxillofacial surgery, paedodontics and orthodontics to dental students. In the specialties of oral biology and oral pathology, a medical laboratory technologist/scientist is required for preparing teaching materials. There should be at least one dental laboratory technologist for each area except oral pathology which requires a medical laboratory technologist/scientist. The following recommended career structure is based on the Federal Government circular on Technologists:

Table 8:2

Categories of Staff	Qualifications
Technologist Grade II	B.Sc. (Dental Tech.) or C & G Finals or LIBST Diploma.
Technologist Grade I	As above with appropriate years of experience
Senior Dental Technologist	As above with appropriate years of experience
Principal Dental Technologist	As above with appropriate years of experience
Assistant Chief Technologist	As above with appropriate years of experience
Chief Dental Technologist	As above with appropriate years of experience

Dental Therapists

Dental therapists are to be employed mainly in preventive dentistry where they demonstrate oral health education techniques to students and patients in addition to performing routine oral prophylaxis.

Nursing Services

The nursing services in the dental hospital must have an experienced nursing officer as head, supported by various cadres of nursing officers, staff nurses, and dental surgery assistants. The dental nursing staff should have been exposed to additional training in dental care and other supporting staff must be physically stationed in the dental hospital.

Radiographers

A fully qualified radiographer with additional training in dental radiography required.

Senior Administrative Staff

There should be an adequate number of senior administrative staff as stipulated in the National Universities Commission (NUC) guidelines for the offices of the Dean, Heads of Department and Academic Staff.

Junior Staff

An adequate and rationalized number of welfare officers, laboratory assistants, cleaners, orderlies and messengers as per NUC guidelines should be available.

These are the minimum requirements for various categories of staff in addition to existing regulations for appointment and promotion of staff in individual institutions.

CHAPTER 9

ACCREDITATION AND MONITORING OF DENTAL TRAINING

Having set out the guidelines on minimum standards, and mindful of the regulatory role it must play, Council stipulates the following sequences and procedures for assessing the operation of dental schools:

Time Table of Assessment:

This should best be conceived as the timetable of the prophylactic involvement of Council in the development of dental schools.

Step I

Once the proposal to establish a dental school in a University is formalized, the Vice Chancellor should communicate this proposal to the Registrar of Council at the same time as the National Universities Commission and Directorate of Planning at the Federal Ministry of Health.

Step II

The Registrar of the Council sends the copy of Council's *Guidelines on Minimum Standards of Medical and Dental Education in Nigeria* (this document) to the Vice Chancellor and at the same time initiates consultation with the National Universities Commission and the Directorate of Planning at the Federal Ministry of Health.

Step III

There is a continuation of detailed planning operations by the University, in concert with the Medical and Dental Council of Nigeria, the National Universities Commission and the Federal Ministry of Health, in coordination with the national planning machinery.

Step IV

In the light of developments in Step III above, the Registrar of Council arranges the visitation time table for the Medical Education Committee of Council, in consultation with the Provost of the College and the Dean of the Dental School concerned, and according to the following sequence:

1st Visitation

Before the first set of students are admitted for pre-clinical course - usually called 'Advisory Visitation'.

2nd Visitation

During the first year, before writing first professional examinations in Anatomy, Physiology, Medical Biochemistry and other subjects like Genetics, Medical Psychology, Public Health Science, Medical Sociology and Biostatistics

3rd Visitation

During the third year (the second year in the 4-year post baccalaureate programme if that is what Council approved for the school), in the first clinical year of the pioneer set of students; the visit will evaluate the facilities for clinical and practical training.

4th Visitation

During the final year of the first set of students, before writing the final professional examinations

Subsequent Visitation

There will be a **Re-Accreditation** visitation to any accredited dental school every five (5) years after the 4th visitation. Council may also arrange a visitation to an institution when there is good reason for doing so, such as infringement of the minimum standards. Where defects have been identified that require corrective action within a specified period of time on the part of the institution, a **Verification** visitation may be undertaken to ensure that such defects have been corrected.

Special Notes on Accreditation Visitation

Any accredited institution which wilfully foils a scheduled visitation by Council and fails to accept visitation within ninety days of the date previously given by Council, shall automatically lose its accreditation status. Therefore, whenever dates of accreditation visitation proposed by Council are not suitable for the authorities of any institution, the members must proffer a new date acceptable to Council within the above time limit. Should they fail to do this, the institution would stand discredited.

The accreditation of any new dental school would be effective from the date accreditation is granted by Council, and not from the date such a school decided to be admitting students without due accreditation.

Procedure of Accreditation:

The process of each visitation should feature:

1. The completion of specific questionnaires seeking information on the state of the institution in respect of the specific criteria outlined in these minimum standards.
2. Inspection of the facilities in the school.
3. Interviews with the staff
4. Interviews with students, at the discretion of the visitation panel.

The completed questionnaires and a summary of the findings would then be presented to Council (through the Medical Education Committee) after each visitation to enable Council decide on the accreditation status of the institution.

Full accreditation shall be granted to any dental school that has satisfied the Guidelines on Minimum Standards of Medical & Dental Education in Nigeria and such accreditation shall be valid for a period of five (5) years after which there shall be a visitation for reaccreditation.

On the other hand, any dental school which fails to achieve the standards stipulated in the guidelines on minimum standards of medical education in Nigeria shall remain unaccredited and may be considered for accreditation only when the school authorities have formally requested for Council's re-visitation and the re-visitation panel makes favourable recommendations acceptable to Council.

Council Observers

There should be a Council Observer at each professional examination until the first set of students graduate. Also once every five (5) years, after graduating the 1st set of students, each professional examination should be attended by a Council Observer.

CHAPTER 10

THE DENTAL CURRICULUM

Philosophy, Aims and Objectives

Philosophy for Training

A general dental practitioner trained in Nigeria should be able to meet the oral care needs of a vast majority of the Nigerian society. This surgeon, equipped with all the relevant clinical competencies, should be able to adapt to changing local conditions. The undergraduate training in dental surgery should prepare him adequately for the professional and administrative leadership role that will be expected of him as a practicing dental surgeon. Besides, each product of the Nigerian dental school system should be exposed to routine processes of pedagogy so that he might be able to assist with further training and supervision of the para-dental staff who are members of his/her oral care team.

In summary, the Nigerian trained dental surgeon should have definite competencies in the areas of diagnosis and management of all common dental disorders as well as be able to execute on-the-job training and supervision of para-dental staff.

Learning Outcomes

There are three aspects of the overall aim of dental education which the learning outcomes seek to accomplish:

- the establishment of a scientific foundation sufficient for understanding the principles of dental practice
- the acquisition of knowledge, skills, attitudes sufficient for the performance of various tasks and roles of the dental surgeon in the community
- the acquisition of information technology, entrepreneurship skills and attitude for the performance of his tasks

National Objectives of University Dental Education

Education is a process aimed at changing human behaviour and can be defined in terms of certain specific objectives. In arriving at the objectives below, attention has been focused on what the dental students, at the end of the training period, should be capable of doing when faced with any clinical situation.

The objectives are to enable the dental graduate:

- undertake independent practice in any part of Nigeria
- achieve a standard of practice comparable to that obtained anywhere else in the world
- obtain a proficient knowledge of professional ethics and appropriate conduct
- appraise research findings and apply same to improve his practice
- identify and define oral health problems of the community
- educate the public on oral health
- advise upon and evaluate the oral health practices of the community and the nation

Competences and Skills upon Graduation

The dental surgeon should:

- possess the cognitive ability to diagnose and manage all common oral disorders
- be able to train, supervise para-dental staff under him and exhibit adequate management and communication skills
- possess the ability to evaluate, interpret and synthesize novel information and data
- be able to use the computer and information technology
- have entrepreneurial skills
- have good communication skills, both written and verbal
- have good Interpersonal skills, especially ability to interact with patients, other health professionals and be able to engage in team work
- have study skills needed for continuing professional development

Course Requirements

The following are recognized as the major disciplines to be included in the curriculum of a dental school:

- Basic Science Subjects and General Studies
- Basic Medical Sciences
- Clinical Medical Sciences
- Basic Dental Sciences
- Clinical Dental Sciences

All courses in this programme are compulsory.

Institutions are free to follow either the pattern of arranging their subjects under pre-clinical programmes with definite time allotment to each area or to follow an integrated pattern in which a definite overlap between the clinical and pre-clinical programmes exists. The students may be exposed to clinical medical and dental sciences as early as possible in the course of their training. In any case, they should not have less than 145 weeks of clinical instruction in medicine and dentistry. At least 66 weeks of these should be for exposure in clinical dental sciences. It is the responsibility of the individual university to arrange the courses to suit its aspirations and training. However, the design below could act as a guide as to the minimum requirements.

Breakdown of Subjects Level By Level

Semesters 1 – 3

- Gross Anatomy (all parts of the body) - *as outlined for the Medical Curriculum in Chapter 6*
- Histology and Histochemistry - *as outlined for the Medical Curriculum in Chapter 6*
- Physiology - *as outlined for the Medical Curriculum in Chapter 6*
- Biochemistry - *as outlined for the Medical Curriculum in Chapter 6*
- Genetics - *as outlined for the Medical Curriculum in Chapter 6*
- Psychology - *as outlined for the Medical Curriculum in Chapter 6*
- Oral Biology (Oral Anatomy, Oral Physiology and Oral Biochemistry)

- General African Studies/Social Studies
- Introduction to Computer Science and Entrepreneurship

Semesters 4 – 6

Basic and Clinical Medical Sciences

- Pharmacology - *as outlined for the Medical Curriculum in Chapter 6*
- General Pathology - *as outlined for the Medical Curriculum in Chapter 6*
- Medical Biology – including
 - Morbid Anatomy and Histopathology
 - Microbiology and Immunology
 - Haematology
 - Chemical Pathology
- Epidemiology, Biostatistics and Environmental Health/Community Health
- Basic Clinical Skills
- Surgery and all subspecialties of surgery
- Medicine and all subspecialties of Internal Medicine

Semesters 7 – 8

Basic Dental Sciences, Introduction to Dental Clinics, Operative Technique,

- Science of Dental Materials
- Dental Operative Techniques
- Prosthetic Techniques
- Dental Anaesthesia Techniques
- Basic Clinical Skills
- Special Clinical Skills
- Operative Technique
- Prosthetic Technique
- Local Anaesthesia
- General Anaesthesia
- Oral Medicine and Dental Therapeutics
- Periodontology
- Dental Practice
- Conservative Dentistry and Endodontics
- Paedodontics
- Paedodontic Operative Technique
- Oral Radiology and Oral Diagnosis
- Oral Pathology
- Oral Surgery
- Advanced Operative Technique
- Community Dentistry/Preventive Dentistry
- Orthodontics
- Periodontology
- Oral/Maxillofacial Surgery
- Primary Health Care
- Electives

Semesters 9 & 10

Final Clinical Year – Clinical Dental Surgery

- Oral/Maxillofacial Surgery
- Oral Pathology
- Preventive Dentistry
- Child Dental Health
- Restorative Dentistry
- Dental Practice
- Administration and Management Studies
- Application of Computer to Dentistry and Entrepreneurship
- Dental Ethics and Jurisprudence

Attainment Level

Candidates are expected to satisfy the minimum clinical requirements as may be specified by each university.

The degree to be awarded should be unclassified, with distinction awarded for excellence in specific disciplines.

Maintenance of Curricular Relevance

There would be re-accreditation of the degree programme every fifth year and the curriculum should also be reviewed every 5 years.

Performance Evaluation Criteria and Processes

There should be several continuous assessment exercises that should constitute 30% of the year's assessment. The evaluation may be in the form of written, clinical, practical and oral examinations.

It is desirable to assess the quality of teaching both by peer and students. This could be by way of questionnaire.

In addition to the in-course assessment, there should be professional examinations as follows:

- 1st professional examination in Anatomy, Physiology, Biochemistry and Oral Biology
- 2nd professional examination in Medical Microbiology & Parasitology, Morbid Anatomy, Pharmacology, Haematology, Chemical Pathology, Epidemiology & Biostatistics and Environmental Health/Community Health
- 3rd professional examination in Medicine and Surgery (including the sub-specialties and General Anaesthesia)
- 4th professional examination in Oral Biology, Science of Dental Materials, Operative Techniques and Prosthetic Techniques
- 5th (Final) Professional Examination in Dental Ethics & Jurisprudence, the Clinical Dental Sciences and the Use of Computers and Entrepreneurship as Applied to Clinical Practice

External examiners shall be required to moderate all professional examinations.

Four-Year Post-Baccalaureate Programme

For institutions that Council approves a four-year post baccalaureate training programme, the levels of training will be restructured into eight semesters as outlined below:

Semesters 1 & 2: Anatomy, Physiology, Biochemistry, Genetics, Psychology, Oral Biology

Semesters 3 – 5: Basic Clinical Skills, Medical Biology, General Pathology, Pharmacology, General Medicine & General Surgery

Semesters 6 – 8: Science of Dental Materials, Dental Operative & Prosthetic Techniques, Oral Pathology, Oral Diagnosis, Dental Clinics & Operative Techniques, Clinical Dental Surgery, Oral & Maxillofacial Surgery, Dental Ethics & Jurisprudence.

CHAPTER 11

ORGANIZATIONAL STRUCTURE OF THE SCHOOL OF DENTISTRY AND ITS RELATIONSHIP TO THE AFFILIATE TEACHING HOSPITAL

It is essential that the Dental School should be located within a Teaching Hospital. The Teaching Hospital should provide all the consumables for clinical services and should be solely responsible for patient matters.

Funding

Provision of adequate funds is one of the most important factors in the establishment of minimum academic standards for every university discipline, and most especially dentistry which is capital-intensive.

In order to permit quality instruction, Dentistry must enjoy separate and direct funding from two sources, namely, the University and the Teaching Hospital. Funds for the provision of pre-clinical facilities should be provided by the National Universities Commission through the University, while those for clinical facilities should be provided by both the National Universities Commission and the Federal Ministry of Health. The recurrent budget for consumable dental materials should be the responsibility of the Teaching Hospital.

Organizational Structure

Dentistry consists of complex but related specialities grouped into departments. The Faculty of Dentistry, in terms of function and development, must enjoy the same status as any other Faculty within the University in order to be able to effectively organize its programmes. Experience from abroad, and even here in Nigeria, has shown that Dentistry cannot develop fully unless the various departments are constituted into a faculty or school. Indeed, in its report of March, 1977, the National Universities Commission Party on Medical Education recommended that each Department of Dental Surgery be developed into a full "School of Dentistry".

The Medical and Dental Council's requirement on the same issue is summarized as follows: *Thus, a training institution for dental surgeons must be of the status of a school or faculty and should not exist, under any circumstances, as a department or departments in a School or Faculty of Medicine. Such a dental institution shall be headed academically and administratively by a Dean or a Provost who must be a dental surgeon as earlier stated.*

There shall be a minimum of four (4) clinical departments with a minimum of 4 academic members of staff per department for the Faculty or School to take off. The following major subject areas should constitute the four core departments:

- Oral and Maxillofacial Surgery
 - Oral Biology/Oral Pathology; Oral and Maxillofacial Surgery
- Restorative Dentistry
 - Conservative Dentistry; Prosthetic Dentistry
- Preventive and Community Dentistry
 - Periodontology, Oral Medicine, Oral Diagnosis
- Child Dental Health

- Orthodontics; Paedodontics

PART FOUR

REGISTRATION & LICENSING OF MEDICAL & DENTAL GRADUATES

CHAPTER 12

REGULATION GUIDING THE REGISTRATION AND LICENSING OF GRADUATES OF MEDICAL AND DENTAL SCHOOLS FOR PRACTICE IN NIGERIA

The Medical and Dental Practitioners Decree No. 23 of 1988 in Sections 8, 11, 12 and 14 stipulates the conditions that must be fulfilled by a medical or dental graduate before he may be registered and licensed to practise in Nigeria and the circumstances under which such a registration or licensure could be effected.

The Council considers it pertinent therefore to include in these guidelines relevant regulations which are necessary to be brought to the notice of all graduating medical and dental students to enable them achieve the appropriate type of registration within the stipulated periods and secure the licence to practice.

Provisional Registration & Internship

New graduates from medical and dental schools need to be registered provisionally before they can embark on their first stage of medical or dental practice, which is the internship training.

Every medical or dental graduate of a medical school must undergo a twelve month period of internship in a hospital recognized by Council for that purpose before he can be fully registered. This internship must be undertaken and completed within twenty four months of the date of graduation. A medical or dental graduate who fails to complete the internship within the stipulated period may be required to sit and pass Council's assessment examination before he can be fully registered.

Therefore all new graduates must endeavour to obtain their provisional registration with minimum delay after passing their final examinations to enable them secure house jobs early enough to complete their internship within the stipulated period. Graduates who find it difficult to secure placements for internship should report without delay to the Registrar of Council. Doctors who are provisionally registered should note that the registration is valid for only two years.

Full Registration

All doctors who have successfully completed their internship training are required by law to obtain their full registration before further medical practise. It is illegal for a doctor who is not fully registered to practice on his own without a consultant's supervision.

Annual Practicing License

All doctors, irrespective of their status or age, are required to obtain an annual practicing license. Any doctor who has not done this would be practicing illegally.

Registration of Foreign Medical Graduates

Nigerian graduates of accredited foreign medical schools are entitled to provisional registration upon their return to Nigeria to enable them undertake their internship.

However, Nigerian graduates of unaccredited foreign medical schools, as well as all expatriate medical doctors from all foreign medical schools, who do not possess recognized professional post-graduate qualifications, are required to sit and pass Council's assessment examination before they can be registered. The Nigerian who passes the assessment examination would be eligible for provisional registration to enable him do his internship while the expatriate who passes the assessment examination would be eligible for limited (Temporary) registration, which would be renewable as specified on the certificate.

Temporary Registration

All expatriate doctors are by law allowed only limited Registration (Temporary Registration) which must be tied to a specific employment. A doctor on limited registration would be breaching the law if he opened, or managed on his own, a private health institution, be it a clinic or a hospital.

Registration of Additional Qualifications

All doctors who have obtained additional Professional post graduate qualification either in Clinical or Basic Medical Sciences are required to register them with the Council before they can put themselves forward as specialists. Doctors who fail to do this but continue to hold themselves out as specialists are doing so illegally.