NIGERIA UNDERGRADUATE MEDICAL AND DENTAL CURRICULUM TEMPLATE, 2012

Health Systems 20/20 is USAID's flagship project for strengthening health systems worldwide. By supporting countries to improve their health financing, governance, operations, and institutional capacities, Health Systems 20/20 helps eliminate barriers to the delivery and use of priority health care, such as HIV/AIDS services, tuberculosis treatment, reproductive health services, and maternal and child health care.

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NIGERIA UNDERGRADUATE MEDICAL AND DENTAL CURRICULUM TEMPLATE, 2012

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FOREWORD

Over several years, the Federal Government of Nigeria through the Federal Ministry of Health has been making concerted efforts at ensuring that Nigerians and all those living within the shores of the country enjoy good health by having easy access to health facilities that are equipped with the most advanced tools for work.

Without a doubt, it is the quality, competence and adaptability of the health workforce deployed to these facilities that would make the difference if this goal is to be realized. This knowledge of the vital role the health workforce must play led to a new thinking that culminated in the Ministry developing a comprehensive National Human Resources for Health Policy in consultation with our development partners and key stakeholders. The Policy was approved by the National Council of Health in January 2007 and since then The National Human Resources for Health Strategic Plan has been drawn up as a follow up to the Policy.

The strategies and activities in the Plan provide a framework to guide and direct interventions, investments and decision making in the planning, development and management of human resources for health at the Federal, State, Local Government and institutional levels. One major focus of this HRH Strategic Plan is to strengthen the capacity and capability of our health workforce via well designed training programmes.

This document is the outcome of such a focus on the foundation training programme in Nigeria for medical doctors and dentists whose professions for good reason are highly regulated. Historically, the different curricula used by medical schools in the country evolved largely from the British programmes. A few institutions have adopted and adapted certain aspects from North America and Central Europe.

In all cases there have been occasional reviews here and there. But this is the first attempt at a widespread and collaborative approach to the production of a template for the curricula for MBBS/BDS degrees. It was borne out of a clear need for training to keep up with the times in terms of ever changing patterns of disease burden and new technology. We are in an era of transformation and there is a dire requirement for the modern medical and dental professional to have multiple competences in the clinical arena and more.

It is a sound foundation that would lead to this and this is the essence of this whole exercise.

In constituting, the 'National Advisory' Committee on Medical & Dental Curriculum, the Federal Ministry of Health engaged relevant personnel within and outside the country, particularly those constitutionally mandated to update the work of medical education in Nigeria i.e. the Medical and Dental Council of Nigeria, National Universities Commission, Medical Schools in the country and Nigerian medical practitioners in diaspora. The Ministry wishes to recognize the effort of USAID's Health Systems 20/20 Project for providing the resources that facilitated the process.

Judging from the pedigree all the participants in this project, the organizations from where they were drawn and the depth of the work that have been done, I am not in doubt that this template shall be well received by our Colleges of Medicine/Medical Schools. I do not hesitate in recommending its adoption in whole or in parts as necessary. It is my sincere belief that the work on medical and dental curricula in Nigeria, reflected in this document, will contribute greatly to improving the overall objective of improving the quality of Human Resource for Health in Nigeria.

Prof. C.O. Onyebuchi Chukwi
Honourable Minister of Health
24th August 2012.

ACRONYMS

A&E	Accident & Emergency
ACLS	Advanced Cardiovascular Life Support
ADHD	Attention Deficit Hyperactivity Disorder
AIDS	Acquired Immune Deficiency Syndrome
AMS	Applied Medical Sciences
ANPA	Association of Nigerian Physicians in the Americas
BDS	Bachelor of Dental Surgery
BSc	Bachelor of Science
CA	Continuous Assessment
CAB	Clinical Application of Basic Sciences
CAM	Complementary and Alternative Medicine
CBS	Core Basic Science
CCM	Critical Care Medicine
CMUI	College of Medicine, University of Ibadan
CNS	Central Nervous System
CPR	Cardiopulmonary Resuscitation
CT	Computerized Tomography
CVS	Cardiovascular System
DSN	Disease notification and surveillance
ECM	Elderly Care Medicine
EMQ	Extended Matching Multiple Choice Question
FAM	Family Medicine
FMOH	Federal Ministry of Health
GES	General studies
GIP	General Introductory Posting
GIT	Gastrointestinal Tract
GOPD	General Outpatient Department
GU	Genito-urinary
HIV	Human Immunodeficiency Virus
HMO	Health Management Organization
HNM	Human Nutrition for Medicine
HOD	Head of Department

ICT	Informatics, Communication, and Technology
IDP	Infectious Diseases Posting
IEC	Information, education and communication
IM	Intramuscular
IT	Information Technology
IV	Intravenous
LEQ	Long Essay Question
MANSAG	Medical Association of Nigerians Across Great Britain
MAP	Medicine as a Profession
MBBS	Bachelor of Medicine, Bachelor of Surgery
MBChB	Bachelor of Medicine, Bachelor of Surgery
MCH	Maternal and child health
MCQ	Multiple Choice Question
MDCN	Medical and Dental Council of Nigeria
MDT	Multidisciplinary Team
MFS	Maxillofacial surgery
MHD	Multidisciplinary Healthcare Delivery
MoH	Ministry of Health
MPH	Master of Public Health
MPHA	Master of Public Health Administration
MRI	Magnetic Resonance Imaging
MSS	Musculo-skeletal system
NG	Nasogastric
NIMR	Nigeria Institute of Medical Research
NMA	Nigeria Medical Association
NUC	National Universities Commission
OBGYN	Obstetrics and Gynaecology
OSCE	Objective Structures Clinical Examination
OSPE	Objective Structured Practical Examination
PALS	Paediatric Advanced Life Support
PATHS2	Partnership for Transforming Health Systems 2
PHC	Primary Health Care
PSM	Preventive and social medicine
RSH	Reproductive and Sexual Health
SAQ	Short Answer Question
SC	Subcutaneous

SEQ	Short Essay Question
SMoH	State Ministry of Health
TMJ	Temporomandibular disorder
TOP	Termination of pregnancy
TWG	Technical Working Group
USAID	U.S. Agency for International Development
USS	Ultrasound Scan

ACKNOWLEDGMENTS FROM HEALTH SYSTEMS 20/20

The production of this document was one of the most challenging and, at the same time, one of the most rewarding experiences of USAID's Health Systems 20/20 project in Nigeria. Updating any medical or dental curriculum is an enormous undertaking. In Nigeria, the many stakeholders, with their valid and yet diverse interests in medical and dental education, increased the level of the challenge. The work was rewarding because helping update medical and dental curricula for universities across Nigeria is essential to producing the high-quality human resources for health that the country needs today and in the future.

In-country support for this project came from the highest level, as the work was championed by the Hon. Minister of Health, Prof. Onyebuchi Chukwu, to whom we are very grateful. His office assigned Dr. Bola Olowu to keep track of this activity on a day-to-day basis, and she proved to be a competent and passionate ally in navigating all the twists and turns encountered in completing this work. We appreciate her contributions.

Special thanks go to the Executive Secretary of the National Universities Commission (NUC), Professor Julius Okojie, who played a key role through his support and guidance right from inception of this activity. The NUC, through the Director Academic Standards, Professor Lawal Alhassan Bichi, provided key contributions, in terms of membership of the Coordinating Committee, provision of technical leadership for the Basic Medical Science Technical Working Group, and volunteering the NUC curriculum for reference by all the Technical Working Groups. Similarly, we commend the effort and commitment of Dr. Abdulmumini A. Ibrahim, past Registrar of the Medical and Dental Council of Nigeria (MDCN), and Dr. Udugbai Ilevbare, its current Registrar, for supporting this work from its inception to its successful conclusion.

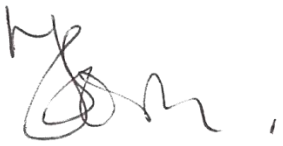
Within USAID-Nigeria, we are grateful for the technical and managerial contributions of the Health Systems Strengthening team, formerly led by Mr. Akinyemi Atobatele and now by Dr. Garoma Kena. The passion and commitment of Dr. Temitayo Odusote helped sustain interest in this work among key stakeholders and we are very grateful to her.

Within Health Systems 20/20 Project, we are very grateful for the support of Dr. Ann Lion, who has championed this work beyond the call of her managerial duties. We also recognize Dr. Oluwaseun Adeleke, Dr. Chinyere Omeogu, Mr. Chima Ibe, and Ms. Rosemary Ehi, who formed the Nigerian backbone of Health Systems 20/20 in the implementation of this work. Ms. Awa Dieng, Ms. Elizabeth Ohadi, Ms Linda Moll, Ms Maria Claudia De Valdenebro and Mr. Bonald Somervell provided U.S. home-office support for this work.

Finally, we would like to recognize the contributions of all members and leaders of the respective Technical Working Groups, and in particular, of the Technical Working Group Coordinator, Professor Oluwabunmi Olapade-Olaopa. Some of them are also key leaders in the Medical Education Partnership Initiative in Nigeria (MEPIN). The experience that Professor Olapade-Olaopa had, in doing similar work with the University of Ibadan's curriculum, "Building Bridges to Produce Tomorrow's Doctors Today," which was funded by the John T. and Catherine D. MacArthur Foundation, made him a very useful contributor to this work. We also are grateful for the contributions of the Nigerian diaspora organizations (The Association of Nigerian Physicians in the Americas and the Medical Association of Nigerians Across Great Britain) to the work of the Technical Working Groups and in particular for bringing the experience of medical and dental curricula from industrialized countries to this work. We

are also grateful for the contributions of the Nigerian Medical Association, which made critical contributions to the work of the Technical Working Groups.

Going forward, we anticipate that the various Nigerian universities, particularly those whose University Senates have already expressed interest in adopting this work, will work with the NUC and MDCN to put this work into action.



Dr. John Stephen Osika, MD,MPH, MHMPP, CCST, $FFPH_{(UK)}$
Health Systems 20/20 Project

ACKNOWLEDGMENTS FROM THE DIASPORA UNIT FMOH

The process of production of this document was a participatory process with the involvement of all the relevant institutions and individuals with interest in Medical and Dental undergraduate education in Nigeria. We wish to express our appreciation for the contributions of all these institutions and individuals to the production of this document. In particular, we would like to thank the key institutions responsible for leading the delivery and regulation of medical education in Nigeria, namely the Medical & Dental Council of Nigeria (MDCN), the Nigerian Universities' Commission (NUC), and the individual Universities in Nigeria, for their respective contributions to this work. Additionally, we would like to appreciate the contribution of the Nigerian Medical Association and the Nigerian Dental association, for providing key inputs from the perspective of Physicians, Surgeons and Dentists already practicing in Nigeria.

We would also like to express our thanks to USAID, through its 'Health Systems 20/20 Project', for providing the pre-requisite facilitative environment, technical and financial resources that allowed all key stakeholders to make their respective contributions to the production of this document.

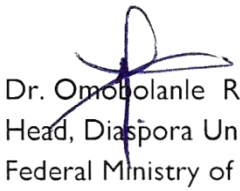
Also notable is the contribution of the "Advisory Committee on Undergraduate Medical & Dental Curriculum," the respective constituted Technical Working Groups, led by the Technical Coordinator, and all individuals who provided input into the work of each of the Technical Working Groups.

We are proud to acknowledge the contribution of our Nigerians in the diaspora, who through the Association of Nigerian Physicians in the Americas (ANPA) and the Medical Association of Nigerian Physicians across Great Britain (MANSAG), made critical contributions to the production of this document.

Our appreciation also goes to the following universities that helped to execute the survey which provided added justification and direction to this activity and other organizations that contributed in many different ways:

- Colleges of Medicine and Teaching Hospitals in Nigeria
    - College of Medicine, University of Ibadan and University College Hospital, Ibadan;
    - College of Medicine, University of Nigeria and University of Nigeria Teaching Hospital, Enugu;
    - College of Medicine, University of Lagosand Lagos University Teaching Hospital;
    - College of Health Science, University of Abuja;
    - College of Health Science,OAU and OAU Teaching Hospital Complex, lie -Ife;
    - University of Calabar Teaching Hospital, Calabar;
    - University of Benin Teaching Hospital, Edo State;
    - Bayero University and Aminu Kano Teaching Hospital. Kano;
    - Ahmadu Bello University and Ahmadu Bello University Teaching Hospital. Zaria;
    - Usman Danfodio University and Usman Dafodio Teaching Hospital, Sokoto.

- Federal Ministry of Health
- Nigeria Primary Healthcare Development Agency
- Guild of Medical Directors
- Association of General Private Medical Practitioners of Nigeria
- Nigerian Institute of Medical Research
- John T and Catherine D MacArthur Foundation



Dr. Omobolanle R. Olowu mni
Head, Diaspora Unit,
Federal Ministry of Health

COMMENT OF THE TECHNICAL WORKING GROUP COORDINATOR /TECHNICAL ADVISER

It is with great delight that I write this commentary for and on behalf of all leads and members of the Technical Working Groups of the National Advisory Committee for the Undergraduate Medical and Dental Curricula, whose efforts have resulted in producing this landmark document. It is the first of its kind and reflects the synergy that can only emanate from the cooperation of stakeholders in the two curricula. Such is its import and potential impact that we sincerely hope it will be replicated for projects in other circumstances. It also marks the end of an "expedition" that started a little over 18 months ago and has hopefully ended successfully in a "newfound" template curriculum.

In developing this document for medical and dental instruction we have tapped into the wealth of experience in medical education and practice (both nationally and internationally) of the members of the committee and their advisers in the larger academic, professional and administrative communities. We have also taken into consideration the views of as many stakeholders as possible in the relatively short time we had for this project. We recognize and accept that we could not have directly involved everyone necessary, let alone satisfy all preferences. However, we plead that those who read and utilize this document will appreciate that the significant efforts that went into developing it were altruistic, thereby enabling the negotiations and compromises required to make the resultant document acceptable to the Committee and hopefully to the end-users. We apologize in advance for any errors or imperfections that may be detected by those who will develop this "Template" into full curricula for individual medical schools. We can only plead that it be considered for what we truly meant it to be, a "working document" that has to be developed into a "document that works" (i.e., full curricula) by each institution that wishes to utilize it to guide its philosophy for training medical and dental students, rather than a one-size-fits-all prescriptive method of teaching and assessment for all medical and dental schools in Nigeria. Furthermore, we recognize that its suitability for metamorphosis into "documents that are working/have worked" (i.e., implementation of the revised curricula) in various medical schools across the country is dependent on the resources of each school as well as their ability to undertake the effective change management necessary for successful implementation of the revised curricula.

The 2012 National Template for the Bachelor of Medicine, Bachelor of Surgery (MBBS) and Bachelor of Dental Surgery (BDS) curricula has the following characteristics:

1. It is entirely home-grown, having been developed from in-country documents of medical instruction, while adhering to international principles and methods of teaching and assessment.
2. All stakeholder groups were involved and consulted in its development, and a "needs assessment" was done, the results of which were considered when the update was undertaken.
3. It is an integrated, system-based, person-centred, community-oriented, competency-driven model meant to provide our students with the best learning opportunities possible.
4. It features early introduction of clinical training to ensure that student learning is well oriented from the beginning of the training.
5. It clearly prioritizes teaching and assessments for each component sub-curriculum to ensure the acquisition of the desired competences for a medical and dental graduate of our country.

6. It provides a schedule of procedures medical and dental students are expected to have done with different levels of supervision thus setting a standard for graduates of all medical and dental schools.
7. It is expected to produce competent, compassionate, and confident graduates who will engage in ethical practice and who will be socially responsive and accountable and globally relevant.
8. It will equip our graduates with life-long, self-directed learning skills and the ability to function effectively and appropriately in a multidisciplinary healthcare team.
9. It retains the general structure of the traditional curriculum to make the modifications easy to understand, for the teachers and students, and thus to implement.

For clarity, we have included a section that specifies the major modifications suggested as well as a section that compares the final "Template" to standard traditional curricula.

We thank the Honourable Federal Minister of Health, Professor Onyebuchi Chukwu, for giving us the opportunity to contribute to this important transformational project. We are appreciative of the efforts of the Medical and Dental Council of Nigeria, the National Universities Commission, and the Diaspora Unit of the Federal Ministry of Health for providing the enabling environment that made the successful completion of this project possible. We thank the supervising officers of our various institutions, who graciously granted us the time to undertake this important assignment. We are truly indebted to our colleagues on the 2005 – 2010 MBBS/BDS Curriculum Review Committee at the University of Ibadan and our computer operating and secretarial staff who, though not officially appointed onto the Advisory Committee, worked tirelessly to review the submissions and prepare the final draft documents. Finally, we are grateful to the US Agency for International Development, through the Health Systems 20/20 project, for providing the funds and the logistics for the project.

God bless Nigeria.

Signed

E. Oluwabunmi Olapade-Olaopa Esq.

Professor of Surgery, University of Ibadan

PART 1. OVERVIEW OF MEDICAL EDUCATION IN NIGERIA

1.1 PREAMBLE

1.1.1 VISION

To be the gold standard for quality and relevant medical education.

1.2 MEDICAL SCHOOLS IN NIGERIA

The origins of medical education in Nigeria can be traced from Yaba Higher College in the 1930s to the establishment of University College Hospital, Ibadan, in 1948. From this modest beginning, there were 30 fully or partially accredited medical schools in Nigeria as of 2010, as shown in Table 1.

TABLE 1. MEDICAL SCHOOLS IN NIGERIA

	Fully Accredited Medical Schools in Nigeria
1	College of Medicine and Health Sciences, Abia State University, Uturu, Abia State
2	College of Health Sciences, Ebonyi State University, Abakaliki
3	College of Medicine, University of Lagos, Idi Araba, Lagos
4	College of Health Sciences, Obafemi Awolowo University, Ile Ife, Osun State
5	College of Health Sciences, University of Port-Harcourt
6	College of Health Sciences, Usman Dan Fodiyo University, Sokoto, Sokoto State
7	College of Health Sciences, Ladoke Akintola University of Technology, Ogbomosho
8	College of Medicine, University of Ibadan, Oyo State
9	College of Medicine, University of Ilorin, Kwara State
10	College of Medical Sciences, University of Calabar, Cross River State
11	College of Medicine, Lagos State University, Ikeja, Lagos State
12	College of Medicine, Ambrose Alli University, Ekpoma
13	Faculty of Medical Sciences, University of Jos
14	Faculty of Medicine, Bayero University, Kano State
15	Obafemi Awolowo College of Health Sciences, Sagamu, Olabisi Onabanjo (formerly Ogun State) University, Ago Iwoye, Ogun State
16	College of Medicine, Imo State University, Owerri
17	College of Health Science, Madonna University, Okija
18	College of Medical Sciences, University of Benin, Benin City , Edo State
19	Oba Okunade College of Health Sciences, Igbinedion University Okada, Benin City, Edo State
20	College of Medicine, University of Nigeria, Enugu Campus, Enugu
21	College of Health Sciences, Nnamdi Azikiwe University, Nnewi
22	Faculty of Medicine, Ahmadu Bello University, Zaria
23	College of Medical Sciences, University of Maiduguri
24	College of Health Sciences, Delta State University, Abraka
25	College of Medicine, Enugu State University of Science and Technology, Enugu
26	College of Health Sciences, University of Uyo, Uyo

Partially Accredited Medical Schools in Nigeria	
1	College of Health Sciences, Bigham University Karu, Nasarawa
2	College of Health Sciences, Niger Delta University, Wilberforce Island
3	College of Health Sciences, Benue State University, Makurdi
4	College of Health Sciences, Bowen University, Iwo

1.3 REGULATION OF MEDICAL AND DENTAL EDUCATION IN NIGERIA

The Bachelor of Medicine, Bachelor of Surgery (MBBS)/(MBChB) and Bachelor of Dental Surgery (BDS) degree programmes are considered as professional courses. As such, medical education and dental education in Nigeria are dually regulated by two separate and autonomous parastatals, the Medical and Dental Council of Nigeria (MDCN) and the National Universities Commission (NUC), on behalf of the Federal Ministry of Health and Ministry of Education, respectively. There is no national qualifying or certifying examination for doctors in Nigeria, as individual schools examine their students. Thus, the MDCN and NUC have the oversight function on medical and dental education and carry out separate accreditation visits to the schools. Also, each has developed guidelines for curricula, the "Redbook" by the MCDN for medical curricula and the "Basic Minimum Academic Standards" by the NUC for dental curricula.

1.4 CURRICULAR ISSUES IN NIGERIAN MEDICAL SCHOOLS

1.4.1 ROLE OF CURRICULA IN UNIVERSITY EDUCATION

University education is directed at developing students to be drivers of societal development upon graduation. To do this, the students must acquire the ability to think independently and to generate ideas and develop themselves; that is, they must learn how to learn that which they need to function effectively in their expected role in society. University teaching has therefore been described as consisting of providing students with guidelines or a framework for learning how to develop themselves.

University curricula are the framework for learning a particular course of study. They encompass the planned and guided learning experiences and intended learning outcomes, formulated through the systematic reconstruction of knowledge and experiences, under the auspices of the school, for learners' continuous and willful growth in personal social competence. Regular review of institutional curricula is statutory and is usually done every five years.

1.4.2 EDUCATIONAL AIM OF MBBS/BDS CURRICULA

The primary aim of the MBBS/BDS curricula is to train doctors and dentists who can work effectively in a health team to provide comprehensive health care to individuals in any community in the nation (urban or rural) and keep up to date on issues of global health.

In Nigeria, development and approval of curricula for the courses/programmes offered by a university is the responsibility of its Senate. However, the relevant regulatory bodies provide "minimum standards" that must be achieved by the university to obtain and maintain their accreditation status. The *Guidelines on Minimum Standards of Medical and Dental Education in Nigeria*, published in 2006 by MDCN, states the specific objectives of medical education in Nigeria as:

a) To provide a sound scientific and professional basis for the training of doctors capable of working anywhere in Nigeria in cooperation with other health workers.

b) To provide such training as will equip these health personnel to render primary health care (PHC). To achieve this goal, there is a definite need to re-orientate the curriculum to give greater emphasis to primary health care.

c) Teaching of Primary Health Care should be multi-disciplinary, involving all clinical departments and some pre-clinical departments.

d) The training of doctors should be more community based than currently. In keeping with the concept of social responsibility, all health training institutions should make a firm commitment to provide community service.

e) To produce doctors who will satisfy internationally recognized standards, and who are able to undertake further training towards specialization anywhere in the world.

f) To produce doctors who have sufficient managerial ability to play a leadership role in health care delivery.

For its part, the "Benchmark Minimum Academic Standards for Undergraduate Programmes in Nigerian Universities," a document published in 2007 by the NUC, presents the following broad objectives of medical education in Nigeria:

(a) To provide a sound scientific and professional basis for the production of doctors and dentists who will be capable of working anywhere in Nigeria and meet the standards of the international community.

(b) To provide such training as would equip these health personnel to render high-quality PHC.

(c) To produce doctors and dentists who will satisfy internationally recognized standards, and who will be able to undertake further training towards specialization within and outside the country.

(d) To produce doctors and dentists with sufficient management ability to play a leadership role in health care delivery.

1.4.3 CURRICULUM REVISION IN NIGERIAN MEDICAL SCHOOLS

Most medical schools in Nigeria are currently using modifications of the traditional curriculum inherited from their parent British universities over 60 years ago. During this period the characteristics of society, and therefore its health needs, have changed appreciably. As such, these instruments of instruction have become outdated and unsuitable for the production of medical graduates who possess the necessary competences to practice in the country. Interestingly, similar to medical curricula in European and American universities, the parent London MBBS curriculum has been revised several times since then and is now an integrated curriculum with 80 percent "core" and 20 percent "self-selected modules," reflecting a change in educational methods.

Global changes in methods of medical instruction notwithstanding, it is difficult, indeed unwise, to wholly adopt curricula designed by medical schools in advanced countries for use in sub-Saharan Africa. This is because there are remarkable differences between developed and developing nations in the quantity and quality of manpower and infrastructure on which these methods depend. Also of significance is the fact that intake into Nigerian medical and dental schools is at the post-secondary-school certificate level, compared with graduate students in most Western countries. This difference in level of knowledge, skills, and attitude of necessity means that Nigerian students are less mature learners, which must be taken into consideration when teaching and assessment methods are being selected. As such, a revision of Nigerian undergraduate curricula must reflect these peculiarities, while ensuring that current global

methods of instruction are utilized and that graduates possess competences that are of international standards.

The majority of the medical schools in Nigeria are currently reviewing their curriculum and are at various stages of completion. The College of Medicine, University of Ibadan (CMUI), recently completed its review, and this has spurred others on, some of which are using the 2010 CMUI curriculum as their template. Others, such as Lagos and OAUTH, are developing theirs *de novo*.

PART 2. INTRODUCING THE 2012 NATIONAL TEMPLATE FOR MBBS/BDS CURRICULA

2.1 INTRODUCTION

There have been numerous challenges in providing sound and qualitative medical education in Nigeria, and these challenges are ever increasing: inadequate infrastructure, facilities, and teachers, and an increasing demand for training. There remains the critical need to continue to contribute to the solutions of the health care problems of Nigeria through sustained provision of medical personnel who understand the special circumstances of the Nigerian environment and can function effectively and efficiently as core health care providers in the Nigerian setting.

As stated earlier, the curriculum of most Nigerian medical schools has not undergone major revision for many years and therefore has not responded to the varied societal changes and health care needs. In addition, the rapid increase in the number of medical schools has meant that the newer schools have simply adopted the curriculum of an older school of their choice. It was therefore necessary to develop a curriculum that would not only be responsive to current health care needs but also utilize modern techniques of teaching and assessment for maximal learning.

The review of the current medical and dental training curricula of the various programmes, which for most Nigerian medical schools was conducted decades ago, is significant because it coincides with a time when Nigeria is facing daunting health care and economic challenges. Also, rapid advances in medical and health sciences have expanded the frontiers of knowledge, while issues in medical ethics, professionalism, and health-related Informatics, Communication, and Technology (ICT) have become a "must-know" for the physician and health care provider of the twenty-first century.

2.2 DEVELOPING THE NATIONAL TEMPLATE FOR MEDICAL AND DENTAL CURRICULA

The development of curricula is the responsibility of the Senate of the individual universities. However, as stated above, the regulatory bodies for medical and dental education, the MDCN and the NUC, are mandated to determine the minimum standards expected of these curricula. The current effort was therefore directed at producing a "National Template" from which each school could develop its own curriculum or use as a reference should it decide to develop its own *de novo*. This "Template" would, however, not be binding on the schools or the regulatory bodies.

2.3 NATIONAL ADVISORY COMMITTEE ON MEDICAL AND DENTAL CURRICULA

2.3.1 GENESIS AND STAKEHOLDERS

Human resource for health is an important building block of health systems. Training health workers on the most up-to-date curricula for their local working environment is therefore critical for strengthening health systems. Preliminary discussions with the MDCN, the Nigeria Medical Association (NMA), the NUC, and the Association of Nigerian Physicians in the Americas (ANPA) from June 26 to July 3, 2010, revealed that though current medical and dental curricula had their undeniable strengths, there was a need to update them to reflect the current demands of medical and dental practice in Nigeria, which have evolved over the years. Health management (e.g., HIV/AIDS, tuberculosis, and maternal and child health) was prominent among the areas identified by stakeholders for urgent reappraisal. Other areas needing improvement identified by stakeholders include:

- For graduates
    - Professionalism
    - Communication and interpersonal skills
    - Medical ethics and medical jurisprudence
    - Clinical decision-making and evidence-based medicine
    - Medicine as a business (administration/management)
    - Defined competencies
    - Social responsibility and social accountability
- For teachers and teaching systems
    - Clinical skills laboratory
    - Standardized training and competencies
    - Standardized, structured, and integrated teaching and assessments
    - Community-oriented attitudes, skills, and knowledge
    - Medical education training of teachers
    - Departments of Medical Education
    - E-medicine (web-based and web-assisted)
    - Utilization of Diaspora resources

Some universities have held discussions regarding updating their medical and dental curricula for a number of years but have so far not been able to galvanize these discussions into updated documents. The University of Ibadan, with a decade of work and resources unlikely to be available in other universities, is the only university that managed to move from discussions to an updated curriculum. Consequently the United States Agency for International Development (USAID) in Nigeria requested USAID's Health Systems 20/20 project to work with all stakeholders in Nigeria, and in the Diaspora, to create the right platform with which to engage key stakeholders and provide policy direction for updating medical and dental curricula that could benefit other universities in Nigeria.

Medical education in Nigeria has multiple stakeholders, and the involvement of each and every one of these stakeholders has played a key role in the successes recorded in this project. The FMOH, which is a key consumer of the products of the medical and dental curricula in Nigeria, has been the national champion for the whole process and has provided the political leadership required to move the process forward. The MDCN and the NUC, the two national institutions responsible for the training and registration of medical and dental practitioners in Nigeria, respectively, have been part and parcel of the process that produced this document. The NMA, which represents the interests of medical practitioners in Nigeria, together with the Diaspora medical organizations, ANPA, and the Medical Association of Nigerians Across Great Britain (MANSAG), made very critical contributions at different stages during the preparation of this document. In particular, ANPA played a crucial role in the initial discussions with USAID and the Health Systems 20/20 project, discussions that eventually secured support for this activity. Last but not the least, were curriculum and content experts selected from medical and dental schools across the nation. As the primary custodians (via university Senates) and executioners of the curricula, they formed the bulk of the groups charged with utilizing their expertise and the experience of teaching locally to harmonize the input of the other stakeholders and develop the updated template.

The product of the work of all these key stakeholders will ultimately enable the production of medical and dental practitioners who are ready to respond to the current realities of medical and dental practice in Nigeria and around the world.

2.3.2 TERMS OF REFERENCE OF THE ADVISORY COMMITTEE

The terms of reference on which this document was produced were as follows:

10. Discuss the current strengths and weaknesses of existing medical curricula.
11. Through the discussions above, review existing literature and experience in utilizing medical curricula in Nigeria and around the world.
12. Identify areas in which the Diaspora and other stakeholders can make contributions to improve undergraduate medical education.
13. Make recommendations and produce reports on how medical education can be improved to meet the current needs of medical practice in Nigeria.

2.3.3 COMPOSITION OF THE ADVISORY COMMITTEE AND TECHNICAL WORKING GROUPS

The Advisory Committee for the production of this document comprises the following members, listed by organization:

1. FMOH
    - Dr. Bola Olowu
    - Dr. Joseph Amedu
2. MDCN
    - Registrar represented by Ag. Registrar - Dr. Nnaemeka Nwakanma
3. NUC
    - Executive Secretary represented by Director, Academic Standards – Professor Alhassan Lawal Bichi

4. Association of General Private Medical Practitioners of Nigeria – Private Health Sector
    - Head – Dr. Anthony Omolola
5. Nigerian Institute of Medical Research
    - Professor Innocent A.O Ujah mni
6. NMA
    - President – Dr. Omede Idris
7. President – Guild of Medical Directors
    - Dr. C.A.T. Cudjor
8. University of Ibadan (curriculum review experience in Nigeria)
    - Professor E. Oluwabunmi Olapade-Olaopa
    - Professor Adesola Ogunniyi
9. President ANPA
    - Dr. Fiemu Nwariaku
10. President MANSAG
    - Dr. Dilly Anumba
11. Health Systems 20/20 Project
    - Dr. John Osika
12. USAID
    - Team leader, HPN
13. PATHS2
    - National Programme Manager – Mike Egboh

2.3.4 THE TECHNICAL WORKING GROUPS

Six Technical Working Groups (TWGs) were formed to work on the six key areas for the update of medical and dental curricula in Nigeria. Lists of the six TWGs and their members appear in Table 2.

TABLE 2. MEMBERSHIP OF THE TWGS OF THE NATIONAL ADVISORY COMMITTEE ON MEDICAL AND DENTAL CURRICULA

TWG Number	TWG Theme	Responsible Organization	TWG Members	Designation
1.	Basic science	NUC	Professor Lawal Al-hassan Bichi	Director, Academic Standards, and Head of TWG
			Professor Lawal Suleman Bilbis	Lecturer, Biochemistry Dept. (DVC Academics), Usman Danfodio University, Sokoto
			Professor Samuel Abayomi Asala	Acting Provost, College of Health Science, University of Abuja
			Dr. Fiemu Nwariaku	Associate Professor of Surgery and Assoc. Dean of Global Health,

TWG Number	TWG Theme	Responsible Organization	TWG Members	Designation
				University of Texas-South Western, Dallas, and President, ANPA
			Dr. Adewale Adebajo	MANSAG: Clinical Professor and Consultant Rheumatologist
2.	Clinical science	MDCN	Professor Adesola Ogunniyi	Head of TWG
			Dr. Yawale Iliyasu	Senior Lecturer/Consultant, Department of Histopathology, Ahmadu Bello University Zaria
			Professor Esther Ofoegbu	Head, Dept. of Medicine, Coordinator Medical Education/Chairman Curriculum Committee, College of Medicine, University of Nigeria
			Dr. Vincent, Idemyor	Professor of Medicine, University of Illinois, Chicago, and ANPA
			Professor Femi Oyebode	MANSAG: Professor of Psychiatry, University of Birmingham, and Consultant Psychiatrist
3.	Integration of basic and clinical science	University of Ibadan	Professor E. Oluwabunmi Olapade-Olaopa–	Head of TWG
			Dr.Yinusa Raji	Reader (Associate Professor), Dept. of Physiology, College of Medicine, University of Ibadan
			Dr. Bosede Bukola Afolabi	Associate Professor and Consultant, Dept. of Obstetrics and Gynaecology, College of Medicine/Lagos University Teaching Hospital Lagos
			Dr. Igho Ofotokun	Associate Professor of Medicine, Emory University, Atlanta, and ANPA
			Dr. Sigismund Wilkey	MANSAG: Consultant, Accident and Emergency Physician
4.	Incorporation of profession-alism and health systems in the country (specifics should be defined in the report)	Nigeria Institute of Medical Research (NIMR)	Professor Innocent A.O. Ujah	Director General, NIMR, and Head of TWG
			Dr. Kenneth C. Iregbu	Consultant, Clinical Microbiologist and Infectious Diseases Specialist
			Dr. Bissallah Ahmed Ekele	Professor/Consultant Gynaecologist, Dept. of Obstetrics and Gynaecology, College of Health Science, University of Abuja
			Dr. Benedict Nwomeh	Associate Professor of Surgery, Ohio State University, Columbus, and ANPA
			Dr. Dilly Anumba	MANSAG: Senior Clinical Lecturer, University of Sheffield, Consultant Obstetrician Gynaecologist and MANSAG President

TWG Number	TWG Theme	Responsible Organization	TWG Members	Designation
5.	Community medicine	University of Ife and National TbL Training Centre	Professor Uche Onwudiegwu	Head of TWG Professor/Consultant, Dept. of Obstetrics and Gynaecology, College of Health Science, OAU, Ile-Ife
			Angela Ekanem Oyo-Ita	Chief Consultant, Community Health, University of Calabar Teaching Hospital, Calabar
			Dr. Mustapha Jamda	Acting HOD, Community Health, College of Health Science, University of Abuja
			Dr. Echezona Ezeanolue	Associate Professor of Paediatrics, University of Nevada, Las Vegas and ANPA
			Dr. Ike Anya	MANSAG: Consultant Public Health Physician
6.	Dentistry TWG		Professor Adeyemi Oluniyi Olusile	Head, TWG Professor, Conservation Dentistry, OAU, Ile-Ife
			Professor Ozoememe N. Obuekwe	Coordinator, Postgraduate Training, University of Benin Teaching Hospital, Edo State
			Dr. Adebola R.A.	Acting Dean, Faculty of Dentistry, Bayero University, Kano
			Dr. Abiodun Olubayo Fasola	Associate Professor, Dept. of Oral and Maxillofacial Surgery, Faculty of Dentistry, University of Ibadan
			Dr. Christopher Okunseri	Director, Predoctoral Programme in Dental Public Health, Associate Professor with Tenure, and Associate Adjunct Professor, Medical College of Wisconsin
			Dr. Benedict O I Cole	MANSAG: Consultant in Paediatric Dentistry at the Newcastle Teaching Hospitals NHS Foundation Trust, and Honorary Lecturer to the University of Newcastle

The technical lead for each of the TWGs was responsible for the following:

- Coordinating the members of the specific TWG
- Ensuring that members of the specific TWG were available for the meetings of the TWG
- Ensuring that the TWG liaised with other relevant specialists/subspecialists and stakeholders (particularly MDCN, NUC, NMA, FMOH, and Nigerian medical Diaspora organizations) to get their input into the work of the TWG
- Ensuring that members of the specific TWG provided their respective written and oral inputs to the report of the specific TWG
- Reviewing and compiling the written submissions of members of the specific TWG

- Submitting the final written report of the specific working group, which reflected the contributions of the members of the TWG and other relevant stakeholders

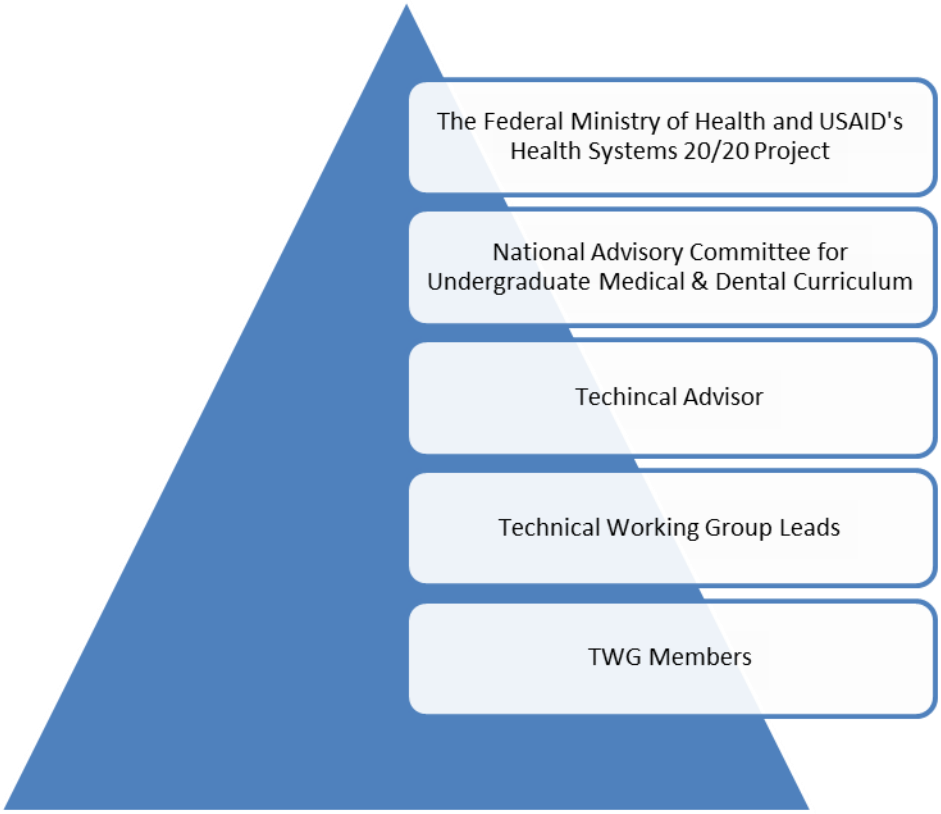
Members of each of the TWGs were responsible for the following:

- Researching and developing assigned components of the TWG report
- Consulting with the TWG lead for clarification or to address concerns
- Where applicable, seeking and presenting other expert advice/input
- Liaising with other subject matter experts as needed
- Participating in team meetings
- Making timely submissions of assigned portion to the technical lead of the TWG

2.3.5 COORDINATOR/TECHNICAL ADVISER

Professor E. Oluwabunmi Olapade-Olaopa was appointed as the Coordinator/Technical Advisor for the update process, based on his experience in directing and designing the curriculum update process of the MBBS curriculum of the University of Ibadan. He was expected to provide the technical advice needed to guide the project. He was also charged with the responsibility of coordinating the tasks of the TWGs and was to collate the TWG reports and produce the template curriculum for the final report (See Figure 1).

FIGURE 1.ORGANOGRAM FOR MBBS AND BDS CURRICULA DEVELOPMENT



2.3.6 CHRONOLOGY OF EVENTS IN THE PRODUCTION OF THE DOCUMENT

The following is a chronology of the events that led to the production of this document:

June 26-July 3, 2010	One-on-one meetings with representatives of key stakeholder institutions to gauge their interest on the issue and its relevance.
February 15, 2011	The Honourable Minister of Health inaugurated an Advisory Committee on undergraduate medical and dental curricula.
February 16-17, 2011	Stakeholders from within Nigeria and outside of the country (e.g., the United Kingdom and the United States) gathered at the Reiz Continental Hotel to share perspectives in medical curricula review and define next steps to achieving the objective. During this meeting, TWGs were constituted to cover basic sciences, clinical science, integration of basic and clinical science, incorporation of professionalism and health systems in the country, and community medicine subspecialties. A dentistry TWG was added at a later date.
September 14-15, 2011	Two-day meeting to define in detail the work to be undertaken by the TWGs, which were delegated to update the various specialty areas of the curriculum and address concerns arising from the process so far.
	Reporting framework/template was agreed upon.
	Relevant specialists from government and nongovernmental organizations within Nigeria and from organizations in the Diaspora (particularly ANPA and MANSAG) were included to obtain their input.
	Literature that provided expert information on medical curricula updating was circulated.
	Draft models of undergraduate medical and dental curricula were produced.
December 13-14, 2011	Meeting to present the first draft undergraduate medical and dental curricula by TWGs.
March 13, 2012	Debriefing of the Honourable Minister of Health on status of the report.
April-August 2012	Review of multiple drafts of the report by TWGs and key stakeholders.
September 2012	Formal presentation and finalization of the report.

2.4 DOCUMENTS FROM WHICH NATIONAL TEMPLATE WAS DERIVED

1. MDCN *Red Book*
2. NUC "Basic Minimum Academic Standards"
3. The 2010 CMUI MBBS Curriculum "Building Bridges to Produce Tomorrow's Doctors Today" (This curriculum incorporates a revised curriculum for the first three years of learning in the Dental School, which makes it the ideal reference for developing the National Template for medical and dental curricula.)
4. Committee of Deans of South Africa "Schedule of Procedures for Medical Graduates"

2.5 REPORTS OF INTERACTIONS WITH STAKEHOLDERS ON CURRICULAR MATTERS

Curricular reviews are guided by the "needs assessment" of relevant stakeholders. In the case of this project, the views of some of these stakeholders had already been obtained and/or were represented on the Advisory Committee, namely the government, the medical and dental associations, the regulatory bodies, and the Diaspora. In light of this, the National Advisory Committee concluded early in its deliberations that it would be necessary to sample the opinions of other stakeholders of the medical and dental curricula as part of the project to ensure that the "needs assessment" was as representative as possible. The Committee therefore decided that it would sample the opinions of the executives, faculty, and students of selected medical schools. Also, it agreed to accept the information obtained by the "stakeholder discourses" done during the CMUI curriculum review process, due to the limited time available, the similarity of groups surveyed with those required for the current project, and the validity of the process.

2.5.1 NATIONAL MEDICAL SCHOOLS SURVEY

A validated questionnaire designed to capture the opinions of executives, lecturers, and students about their curricula, learning environment, teaching processes, skills acquisition, and graduate competences was sent to eight medical schools. The schools were selected to ensure a balanced representation of the institutions nationwide. The completed questionnaires were collected by the Secretariat and sent to the Coordinator/Technical Adviser for collation, analysis, and interpretation.

A summary of the findings are as follows:

- Objectives of curricula are well known.
- Desired competences are also well known and are guided by the curricula.
- There is a disconnection between the objective and desired competences of the curricula and the teaching processes.
- University environments are unsuitable for teaching and learning.
- Graduates usually acquire the competences required for general medical and dental practice at the undergraduate level.
- Most curricula do not prepare students for postgraduate training and clinical practice.

- Curricula content are satisfactory but are not community-oriented.
- A significant number of students do not practice the profession after graduating.
- Curricula do not have multidisciplinary postings, and students do not understand future roles with other members of the health care team.
- Nigerian medical and dental graduates have equivalent professional skills.
- There is a general lack of managerial and entrepreneurial skills.

2.5.2 SUMMARY OF FINDINGS OF CMUI STAKEHOLDER DISCOURSES

The consensus of the stakeholders was that the current curriculum is outdated and that the graduates it produces lack the new competencies required for modern medical practice. This was thought to be due to the following weaknesses in the instrument:

i. A lack of early clinical orientation of students.

ii. Methods of teaching and assessment were disjointed.

iii. Insufficient number of medical teachers with formal training in medical education.

iv. A lack of community outreach and the understanding of the national health manpower needs by the students.

v. Increasing insensitivity of the teaching hospital to the requirements of medical instruction, as it is now more service oriented. Further, its cost-recovery programme has limited the number and variety of cases for medical instruction.

vi. Limited preparation of students for practice in the "real world."

vii. Poor remediation and lack of exit points for chronically repeating students.

viii. A lack of opportunity for suitable students to undertake intercalated (research) degrees.

2.6 CONCLUSION

The processes above provided the information on which the template for the update of medical and dental curricula would be based. After considering several modern curriculum models and teaching methods, the Advisory Committee chose an integrated, system-based, community-oriented philosophy of instruction, and the process for producing a template began.

PART 3. THE 2012 NATIONAL TEMPLATE FOR MBBS/BDS CURRICULA

This document is the result of the first collaborative effort aimed at producing a National Template for medical and dental curricula. The collaborative effort maximized the skills of Nigerian medical and dental education teachers from within the country and the Diaspora, under the watchful eyes of representatives of the regulatory bodies, the MDCN, and the NUC. The document, therefore, is a home-grown product that takes into consideration the peculiarities of the learning environment in the nation and is directed at its health needs. It is expected that this revised curriculum will serve the purposes for which it has been intended. Since medical schools/universities have their unique trademarks and special circumstances, it is expected that the new curriculum will serve as a benchmark upon which training will be based, making allowances for variations and emphasis. In the end, current local, national, and global needs of all stakeholders will have been addressed.

An integrated, system-based undergraduate medical curriculum has been selected as the philosophy for the National Template. The revised 2010 CMUI MBBS curriculum – an integrated, system-based, person-centred, community-oriented, competency-driven instrument of medical instruction – has been used as the template, with essential concepts from the MDCN *Red Book* and NUC Benchmark Standards incorporated.

3.1 SUMMARY OF SUGGESTED MODIFICATIONS IN THE NATIONAL TEMPLATE FOR MBBS AND BDS CURRICULA

3.2 CONTENT

In line with current global requirements in medical education, new postings/courses are suggested for inclusion in this curriculum, along with increased emphasis in others. The adoption of the integrated method of instruction for this template has enabled the repackaging of the remaining postings, while ensuring that all essential contents were retained.

1. Postings/Disciplines within which Increased Emphasis is Suggested

a. Radiology and Radiotherapy/Radiation Oncology (Radio-Diagnosis and Therapy)

b. Psychiatry

c. Human Nutrition

d. Surgical Specialties – Anaesthesia, Ophthalmology, Dentistry/Maxillofacial Surgery, and Otorhinolarngology

e. Health Economics and Health Administration/Management

f. Community Medicine and PHC/Preventive and Social Medicine

2. Suggested New Postings/Courses

The aim of suggesting that these new courses are taught is to improve the quality of doctors produced by increasing the competences acquired during training. These disciplines are expected to start as units within existing departments and to grow into individual departments or institutes, as appropriate. Ultimately, their existence as separate disciplines will encourage current and future academic staff to develop academic tracks and attract postgraduate research in these specialties.

Suggested new courses/disciplines in chronological order:

a. GIP - General Introductory Posting

- Orientation Programme of the University
- Orientation into the College of Medicine
- Introduction to Critical Care Management
- Introduction to Medicine as a Profession

b. AMS – Applied Medical Sciences

- Molecular Biology and Genetics
- Genetic Basis of Disease
- Biotechnology
- Biomedical Informatics
- Fundamentals of Bioengineering
- Mathematical Medicine/Computational Biology

c. MAP - Medicine as a Profession

- History/Landmarks of Medicine
- Sociology of Medicine/"The Patient as a Person"
- Communication/Interviewing Skills
- Literature and Medicine and Manuscript Writing Skills
- Medical Jurisprudence and Professional Liability Issues

d. MHD - Multidisciplinary Health Care Delivery (incorporating Medical Humanities)

(Joint sessions for medical, dental, nursing, physiotherapy, human nutrition, and pharmacy students)

- Moral Philosophy, Clinical Ethics, and Professionalism
- Medical Ethics
- Communication/Interviewing Skills
- Health Care Delivery as an Interdisciplinary Profession
- Human Resources for Health

e. ***CAB - Clinical Application of Basic Sciences***

- Clinical Application of Core Basic Sciences (CBSs)
- Clinical Applications of Applied Medical Sciences/Laboratory Medicine and Pharmacology

f. ***CCM - Critical Care Medicine***

- Basic Life Support/First Aid
- Paediatric/Obstetric/Medical/Surgical Emergencies
- Care of the Critically Injured Patient
- Nutrition in the Injured/Chronically Ill Patient
- Palliative Care and End-of-Life Issues
- Management of Mass Casualty

g. ***ECM – Elderly Care Medicine (Geriatrics and Gerontology)***

- Physiological and Psychosocial Changes in Old Age
- Medical and Surgical Diseases of the Elderly
- Psychiatric Disorders of the Elderly
- Nutrition in the Elderly
- Competence and Forensic Issues in the Elderly

h. ***IDP - Infectious Diseases Posting***

- Epidemiology
- Prevention and Control
- Aetiological Agents (incubation periods, morphology)
- Pathogenesis (acquisition and transmission)
- Laboratory Diagnosis
- Clinical Presentation and Management
- Socioeconomic Relevance

i. ***FAM – Family Medicine***

- The Family as a Social System
- Man and His Environment
- Bio-Psycho-Social Model of Care
- Patient-Centred Clinical Method
- Health Systems and Services Development

j. HNM – Human Nutrition for Medicine

- Nutrition and Health
- Nutrition in the Life Cycle
- Measuring Nutrition in Health and Diseases
- Nutrition in the Prevention and Management of Diseases

k. RSH – Reproductive and Sexual Health

- Menstrual Disorders
- Materno-Foetal Medicine
- Male and Female Infertility
- Male and Female Reproductive Neoplasia
- Menopause and Andropause
- Sexual Disorders
- Sexually Transmitted Infections
- Legal and Ethical Issues in Reproductive Health.

l. CAM – Complementary and Alternative Medicine

- Herbal and Traditional Medicine
- Spiritual Medicine
- Energy and Mind-Body Medicine
- Biologically-Based Medical Practice
- Public Health Aspects of CAM

3. Suggested Postings for Repackaging

These topics/courses are suggested for repackaging, regrouped as indicated to make teaching and assessment of medical/dental students more effective.

a) **Old** – Anatomy, Physiology, and Biochemistry →**New** – Integrated CBSs

b) **Old** – Block Posting (Pathology and Pharmacology) →**New** – Integrated Block Posting

c) **Old** – Medicine I and Surgery I →**New**– Integrated Introductory Clinical Posting

d) **Old**– Epidemiology and Biostatistics and Community Medicine →**New** – Preventive and Social Medicine (Public Health Science, Community Medicine I–III, and Human Nutrition)

4. Retained Postings

All other "old" postings may be retained as in the current curriculum (i.e., Community Medicine I–III, Medicine II/III, Surgery II/III, Junior, Senior, and Revision Paediatrics, and Obstetrics and Gynaecology) but adjusted to fit into their new line frames.

3.3 BROAD OBJECTIVES OF POSTINGS/COURSES

The broad objectives of the postings/courses are:

1. GIP – 200L (Multidisciplinary)

The objective of this posting is to ensure that new entrants know the vision and mission of their medical schools. They are also to acquire the skills that will enable them participate actively in the management of victims of single and mass casualty.

2. Integrated CBS Courses I and II – 200L (Partly multidisciplinary)

The aim of this integrated posting is to provide a solid foundation in the core basic medical sciences so they can understand the normal function and regulation mechanisms of the human body system.

3. Integrated Clinical Application of Basic Science Course – 300L

The aim of this posting is to ensure the ability to apply the knowledge of the core and basic medical sciences to the pathogenesis and principles of management of clinical entities.

4. MAP – 200L – 600l (Multidisciplinary)

The objective of this posting is to impart the knowledge of the origin and landmarks of modern medical and dental practice and to gradually inculcate the professional and ethical responsibilities of doctors and dentists in the students. Students will also be taught all aspects of medical humanities, especially the sociological and legal aspects of medical practice.

5. MHD – 200L -300L (Multidisciplinary)

The aim of this posting is to ensure understanding of the interrelationship between the different health care professionals and their complementary roles in health care delivery and inculcate unified team approach to patient care.

6. Integrated Block Postings/Applied Basic Science (Integrated Pathology and Pharmacology) – 300L-500L

The aim of these postings is to provide a sound knowledge and understanding of basic pathologic processes, mechanisms of diseases, and the pharmacologic basis of treatment of these diseases.

7. Clinical Introductory Posting – 300L (Multidisciplinary)

The aim of this posting is to orientate students to the practice of clinical medicine in the hospital setting.

8. Integrated Clinical Science Postings – 200L-600L (Partly multidisciplinary)

The aim of these postings is to ensure the acquisition of the right attitude, as well as global standards in knowledge and skills of the clinical sciences with which to diagnose and treat common diseases and emergencies in adults and children, in hospital and community-based settings.

9. Integrated System-Based Core Lectures – 400L (Part of Integrated Clinical Science)

The aim of these lectures is to impart knowledge in a manner that would ensure the understanding of the role of each specialty in the pathogenesis of disease entities in all systems and the multidisciplinary approach to their management. The lectures will be taught in system-based modules (to which all basic and clinical science specialties will contribute, as appropriate) as a core lecture series in yearly cycles. The series will require horizontal and vertical integration of lecture topics and schedules.

10. Community Medicine – 200L-600L (Partially multidisciplinary)

The aim of this posting is to inculcate the core competences required to execute activities that constitute and promote preventive and social aspects of health care.

11. Integrated Infectious Diseases Posting – 300L – 600L (Partially multidisciplinary)

The aim of this posting is to produce medical graduates who understand the epidemiology, pathogenesis, management, and socioeconomic implications of infectious diseases.

Note – Multidisciplinary postings/courses are to be taken by all undergraduate health science students of the university at the same level.

3.4 CONSTITUENT DEPARTMENTS OF CORE DISCIPLINES OF THE MBBS/BDS COURSES

3.4.1 INTEGRATED CBSS

Constituents Disciplines:

1. Anatomy (for MBBS/BDS)
2. Physiology (for MBBS/BDS)
3. Biochemistry (for MBBS/BDS)

3.4.2 INTEGRATED LABORATORY MEDICINE/APPLIED BASIC MEDICAL SCIENCES

Constituent Departments:

4. Histopathology
5. Haematology
6. Chemical Pathology
7. Medical Microbiology (including Parasitology and Virology)
8. Pharmacology

3.4.3 INTEGRATED CLINICAL SCIENCES (MEDICINE)

Constituent Disciplines:

- Medicine
- Surgery
- Paediatrics
- Obstetrics and Gynaecology
- Psychiatry

- Anaesthesia
- Ophthalmology
- Otorhinolaryngology
- Dentistry/Maxillofacial Surgery

} Special Surgery

- Family Medicine
- Community Medicine
- Radiology
- Radiotherapy

} Radio-Diagnosis and Therapy

3.4.4 INTEGRATED CLINICAL SCIENCES (DENTISTRY)

- Oral and Maxillofacial Surgery
- Oral Pathology
- Restorative Dentistry
- Child Oral Health
- Periodontology and Community Dentistry

3.4.5 COMMUNITY MEDICINE AND PHC/PREVENTIVE AND SOCIAL MEDICINE

Constituent Disciplines:

- Epidemiology Medical Statistics and Environmental Health
- Community Medicine
- Human Nutrition (for MBBS)
- Family Medicine
- Health Promotion and Education
- CAM

3.5 COMPARISON OF PROPOSED TEMPLATE AND CURRENT MBBS CURRICULA:

3.5.1 COMPOSITE POSTINGS

The traditional MBBS curriculum is compared with the proposed Template in Table 3.

TABLE 3. TRADITIONAL MBBS CURRICULUM AND PROPOSED TEMPLATE, BY SCHOOL.

School	Traditional Curriculum		Proposed Template	Comment
Pre-Clinical School	**Course/Posting**		**Course/Posting**	
200 level (1st and 2nd Semesters)	Anatomy Physiology Biochemistry Epidemiology and Biostatistics Demography		**Integrated CBSs** (Anatomy, Physiology, Biochemistry)	Course to be taught in coordinated system-based modules to achieve integration.
			GIP/Introduction to Medicine as a Profession	Introduction to Professionalism and Ethics.
			MHD Introduction to the Roles of Various Health Care Specialists in MHD CAM Human Nutrition Preventive and Social Medicine I (Public Health Science) Medicine in the Community Critical Care Medicine Family Medicine Psychology	To give students a broad-based knowledge in applied medical sciences and an early orientation to MHD.
			Mid-Semester Vacations	
300 Level (1st Semester)	Anatomy Physiology Biochemistry Psychology		Block Posting I (Introductory Pathology and Pharmacology)	To give early introduction to the applied basic sciences.
			Clinical Application of CBS Human Nutrition Family Medicine	Clinical applications of core basic subjects will be taught in system-based modules.
			Revision CBS	
	Part I MBBS Examinations (Anatomy, Physiology, Psychology, Biochemistry)		Part I MBBS (2nd MB) Examinations (Anatomy, Physiology, Biochemistry, CAB, Psychology, AMS, MAP, PHS, and CAM)	Candidates that fail four attempts at this exam shall exit and may aim for a BSc in one of the CBSs or in certain instances the BSc Medical Sciences.
			Vacation	
300 Level (2nd Semester)	Introductory Posting in Pathology and Pharmacology		Clinical Introductory Posting	Orientation to Clinical School with sessions in A&E Dept. GOPD.
	Medicine I		Integrated Clinical Posting I	Integrated posting involves teaching in general medicine and surgery.
	Surgery I			
	Block Posting I		Block Posting II	Integrated posting that involves teaching core basic and basic system pathology and pharmacology.
	Vacation		Vacation	

School	Traditional Curriculum		Proposed Template	Comment
Pre-Clinical School	**Course/Posting**		**Course/Posting**	
400 Level (1st Semester)	Block Posting II		Integrated Block Posting II	Taken in first semester of 300 level.
	Medicine II		Radio-Diagnosis and Therapy I	Integrated posting involves system-based teaching in radiology, specialty medicine and surgery, paediatrics, and obstetrics and gynaecology, with vertical integration with the basic sciences (pathology and pharmacology). Also includes integrated Infectious disease posting.
	Surgery II		Junior Paediatrics	
	Block Posting II		Medicine II	
	Vacation		Surgery II	
400 level (2nd Semester)	Gynaecology		Obstetrics and Gynaecology I	
	Junior Paediatrics		Special Surgical Posting I	
	Special Posting I		Infectious Diseases Posting	
	Vacation		Preventive and Social Medicine II (Community Medicine I)	
500 level (1st Semester)	Block Posting III		Vacation	
	Part II MBBS Exams (Pathology and Pharmacology)		Block Posting Revision	
	Junior Obstetrics and Gynaecology		Part II MBBS Examinations (Pathology and Pharmacology, CAB, CAM, and MHD).	To include clinically oriented questions. Candidates that fail three attempts at this exam shall exit and may transfer to a suitable BSc course in the BSc Medical Sciences (if available).
	Senior Paediatrics		Obstetrics and Gynaecology II	
	Radiology		Senior Paediatrics	
	Vacation		Family Medicine I	
500 level (2nd Semester)	Block Posting II		Revision Obstetrics and Gynaecology	
	Senior Obstetrics and Gynaecology		Preventive and Social Medicine III (Community Medicine II)	
	Outside Posting		Revision Paediatrics	
	Paediatrics/Obstetrics and Gynaecology Revision		Psychiatry I	
			Self-revision	
	Part III MBBS Examination (Paediatrics and Obstetrics and Gynaecology)		Part III MBBS Examination (Paediatrics and Obstetrics and Gynaecology) - To include Applied Basic Science questions	Candidates that fail three attempts at this exam shall exit and may transfer to a suitable BSc course in the BSc Medical Sciences (if available).
600 level (1st Semester)	Community Medicine		Vacation	
	Special Posting II		Family Medicine II	
			Special Surgical Posting II	
	Elective Posting		Radio-Diagnosis and Therapy II	
			Elective Clinical/Research Posting	
	Vacation		Psychiatry II	

School	Traditional Curriculum	Proposed Template	Comment
Pre-Clinical School	**Course/Posting**	**Course/Posting**	
600 level (2nd Semester)		Vacation	
	Medicine III	Preventive and Social Medicine IV (Community Medicine III)	
	Surgery III	Medicine III and Surgery III	Include revision of other clinical and PHS subjects.
	Psychiatry	Self-Revision	
	Revision		
	Part IV MBBS Examination – Medicine, Surgery, and Preventive and Social Medicine	Part IV MBBS Examinations - Medicine (to include Psychiatry as a separate clinical examination), Surgery, and Preventive and Social Medicine	Candidates that fail four attempts at this examination shall exit and may transfer to a suitable BSc course in the BSc Medical Sciences (if available).

3.6 COURSE SYNOPSIS FOR THE NATIONAL TEMPLATE FOR THE MBBS AND BDS CURRICULA

Table 4 presents courses and their suggested duration for the MBBS/BDS curricula.

TABLE 4. COURSES AND SUGGESTED DURATION FOR THE MBBS/BDS CURRICULA

	Title of Courses (all are compulsory)	Suggested Total Number of Weeks
S/N	**CBS – 200 and 300 Levels**	
1	GIP	4
2	Integrated CBS	36
3	Clinical Application of Basic Science	12
4	Introduction to Professionalism and Ethics	4
5	MHD	4
	Cumulative Total	**60**
	MBBS Part I Final (300 Level 1st Semester)	
	Basic Medical Science – 200, 300, 400, and 500 Levels	
6	Integrated Pathology and Pharmacology	20
	Cumulative Total	**80**
	MBBS Part II Final (500 Level 1st Semester)	
	Clinical Science I – 200, 300, 400, and 500 Levels	
7	Clinical Introductory Posting	4
8	Paediatrics	20
9	Obstetrics and Gynaecology	20
	Cumulative Total	**124**
	MBBS Part III Final (500 Level 2nd Semester)	
	Clinical Science II – 200, 300, 400, 500, and 600 Levels	
10	Medicine	20
11	Surgery	20
12	Surgical Specialties	16
13	Preventive and Social Medicine	20

Title of Courses (all are compulsory)		Suggested Total Number of Weeks
S/N	**CBS – 200 and 300 Levels**	
14	Family Medicine	8
15	Radio-Diagnosis, Intervention, and Therapy I	8
16	Psychiatry	8
17	Integrated Infectious Diseases Posting	4
18	Elective Clinical, Research Posting, or Clerkship	4
	Cumulative Total	**232**
	MBBS Part IV Final (600 Level 2nd Semester)	

3.7 COURSE SYNOPSIS AND AGGREGATE UNITS FOR THE BDS CURRICULUM

Table 5 presents courses and their suggested duration for the BDS curriculum.

TABLE 5. COURSES AND SUGGESTED DURATION FOR THE BDS CURRICULUM

Title of Courses (all are compulsory)		Total Number of Weeks
S/N	**Core Basic Medical Sciences -200 and 300 Levels**	
1.	GIP	4
2.	Integrated Core Basic Medical Sciences	36
3.	Clinical Application of Basic Medical Sciences	12
4.	Medicine/Dentistry as a Profession	4
5.	MHD	4
	Cumulative Total	**60**
	BDS Part I Final (300 Level 1st Semester) Total credit units available for transfer	
	Basic Medical Sciences-200, 300, and 400 Levels	
6.	Integrated Pathology and Pharmacology	16
7.	2 Term Papers (2 Units each)	
	Cumulative Total	**76**
	BDS Part II Final (400 Level 1st Semester) Total credit units available for transfer	
	Clinical Sciences – 200, 300, and 400 Levels	
8.	Clinical Introductory Posting	4
9.	Paediatrics	8
10.	Medicine	14
11.	Surgery	14
12.	Surgical Specialties	8
13.	Preventive and Social Medicine	8
14.	Radio-Diagnosis, Intervention, and Therapy	4
15.	Integrated Infectious Diseases Posting	4
	Cumulative Total	**140**
	BDS Part III Final (400 Level 2nd Semester)	
	Dental Clinical Postings I (400, 500, and 600 Levels)	
16.	Laboratory and Operative Techniques in Dentistry	12
	Cumulative Total	**152**

	Title of Courses (all are compulsory)	Total Number of Weeks
	BDS Part IV Final (500 Level 1st Semester)	
	Dental Clinical Postings II (400 and 500 Levels)	
17.	Child Oral Health	16
18.	Oral Medicine and Pathology	16
19.	Two term papers (two units each)	
	Cumulative Total	**184**
	BDS Part V Final (500 Level 2nd Semester)	
	Dental Clinical Postings III (400, 500, and 600 Levels)	
20.	Periodontology and Community Dentistry	16
21.	Restorative Dentistry	16
22.	Oral and Maxillofacial Surgery	16
23.	Elective, Clinical, Research Posting or Clerkship	4
	BDS Part VI Final (600 Level 2nd Semester)	
	Cumulative Total	**236**

3.8 TEACHING AND ASSESSMENT FOR THE NATIONAL TEMPLATE FOR MBBS/BDS CURRICULA

3.8.1 METHODS OF INSTRUCTION AND ASSESSMENT

An important objective of this curriculum template is to ensure that medical and dental students in each class have had equivalent teaching and clinical exposure at the end of each session. This will be achieved by rotating the students through similar postings and lecture series during the sessions. Additionally, the focus of educational institutions should be shifted from "teaching" (i.e., what lecturers teach) to "learning" (i.e., what the students learn). In this regard, "assessment" (i.e., tests/examinations) is now known to be the main driver of student learning. New methods of assessment and instruction that have been shown to improve learning worldwide were therefore adopted in this national MBBS/BDS curriculum template. These can be broadly classified as follows:

a. Competency-Based Teaching

This is achieved by the following:

i. Identification of desired competencies (the learning objectives of each discipline) – These are the attitudes, skill set, and knowledge mandated by the philosophy and objectives of the course and adjudged to be responsive to the health needs of the community each medical school subserves. These competencies should be clearly communicated to students at the beginning of each level and reinforced throughout that level.

ii. Learning-objective-directed teaching – Medical instruction has been directed at these learning objectives to ensure the acquisition of competencies and to make the graduates relevant to their communities (local, national, and international).

iii. Prioritization of desired competencies (to ensure focused learning of the identified health needs of the community) - The knowledge and skills to be acquired by students should be classified into "must know/must know to pass," "should know/should know to pass," and "may know/may know to pass." Teaching contact time and assessments should then be appropriated according to this privatization as 50 percent, 30 percent, and 10 percent, respectively.

iv. Competency-based assessment (skills-specific evaluation of students) – "Assessments" must be refocused to test the acquisition of the "desired competencies," that is, the student should not just "know how" (describe) but should be able to "show how" (demonstrate) the particular skills learned.

b. Competency-driven learning

Increased emphasis should be placed on the acquisition of practical skills by the students. As such, approximately 60 percent of the teacher-student contact time should be spent in practical/clinical teaching sessions, while the remaining 40 percent should be spent in didactic teaching sessions. In addition, there should be increased emphasis on small-group teaching sessions/tutorials (preferably using the problem-based approach with increasing seniority), with a concomitant reduction of large-group teaching sessions (lectures). The ultimate aim of these efforts should be the reduction in the number and frequency of lectures, with the most important lectures being given in an integrated manner.

c. Schedule of procedures

In line with the adoption of competency-based learning and assessment methods, a schedule of procedures that students of MBBS and BDS courses should follow has been developed to guide teaching and student-learning. The level of supervision required for each procedure to be done has also been suggested, whilst some procedures have been excluded for undergraduate learning. This is to guide the uniformity of skill acquisition by all students undertaking these courses, regardless of their primary institution. It will also provide a national standard against which all graduates can be tested (i.e., competency-based assessment). Finally, it could be used as a foundation for developing similar schedules (i.e., competence level) for postgraduate instruction or residency training programmes.

d. Integrated system-based teaching

Integration of teaching and assessment of different disciplines is termed "horizontal" if it is "concurrent," that is in the disciplines in both the preclinical or clinical schools, and "vertical" if done to involve the disciplines in both schools "sequentially". This will result in early introduction of the students to clinical aspects of medicine and thus a better understanding and application of basic sciences to clinical medicine. Integration therefore aims to enable students to have a "360-degree" understanding of clinical entities. The integrated clinical postings should be composed of a system-based lecture series, with students undertaking clerkships in rotation in the component disciplines/specialties in groups, during which additional tutelage will be given.

In this curriculum template, integration occurs during the following courses:

i. Integrated CBSs – 200L/300L first semester (horizontal integration)

ii. Clinical Application of CBSs – 300L first semester (vertical integration)

iii. Integrated Clinical Posting I – 300L second semester (horizontal integration)

iv. Integrated Clinical Posting II – 400L (vertical and horizontal integration)

v. Core Lectures – 400L (vertical and horizontal integration)

vi. Integrated Block Posting I – III (Basic Medical Sciences) – 300L and 500L (horizontal integration)

vii. Infectious Diseases Posting – 400L (horizontal and vertical integration).

e. Community orientation

This is to give the students community-oriented learning throughout the period of medical instruction by ensuring repeated contact with the health needs and the peculiarities of their community. This will encourage students to acquire an attitude of being responsive, relevant, and accountable to their community in their practices. The students should undertake visits to the community (including health clinics) starting at the 200 level. In addition, all clinical postings should have a dedicated community-oriented component. Additional competencies in community orientation should include cultural sensitivity, dispute resolution, assessment of specific community needs, and mobilization of community resources.

f. Self-directed learning/research and audit orientation

Self-directed learning should be encouraged by the use of problem-based teaching in tutorials and the introduction of e-learning and term projects/papers, which are designed to encourage students to seek information independently and to think in a critical and analytical manner. Additionally, term projects will encourage the acquisition of research and audit culture.

g. Introduction of feedback processes through formative assessments

Formative assessments are examination processes by which information is provided to both students and teachers about current performance that can be used to improve learning and teaching in the future without consequence. This National Template advocates the adoption of this two-way feedback mechanism between the students and their teachers to ensure continuous self-evaluation by both parties. This evaluation system must include methods of identifying students and teachers who fail to meet the designated objectives, as well as opportunities for correcting these deficiencies by both student and teacher.

h. Increased contact between teachers and students and improved mentoring

This curriculum template encourages increased contact between the teachers and their students, which should improve mentoring. This is as a result of the increased proportion of small-group teaching and practical/clinical sessions, as well as the project supervision required by the students for their term papers.

i. Multidisciplinary team learning approach

In line with current medical and dental instructional methods, several postings in this curriculum template are designed to be multidisciplinary. This approach is to introduce students of the relevant undergraduate and professional programmes in the medical schools and their teaching hospitals to the multidisciplinary team (MDT) care of patients. The team is to be composed of experts from different health-related disciplines, such as physicians, nurses, pharmacists, administrators, human nutritionists, dieticians, health educators, and social scientists/workers, who come together for the common purpose of looking after patients or a community. The MDT-care approach gives measurable positive outcomes in patient care as it fosters unity, understanding, and mutual respect between the members of the team.

j. Allotment of credits units

Medical schools may wish to allot credit to courses offered using their university's credit system. All courses are, however, compulsory and only predetermined credit points will be available for transfer at the stipulated exit points, that is, after the MBBS examinations.

3.8.2 OPPORTUNITY FOR COMBINED OR INTERCALATED DEGREE PROGRAMMES

This curriculum template provides suitable medical and dental students with an interest in research, public health, and the business of medicine, and the potential to undertake them successfully, the opportunity to pursue a combined degree programme. This is because all students will be at the same level of instruction at the end of every session. This can be a BSc in one of the basic sciences; a PhD, for those who wish to pursue an academic career in medicine; or the Master of Public Health (MPH)/Master of Public Health Administration (MPHA), degrees for those who wish to pursue a career in public health medicine or medical administration. Students may commence the combined degree programmes at the end of the 300 level. At the completion of the intercalated degree, these students shall return to the MBBS/BDS programme at the 400 level.

3.8.3 REMEDIATION AND EXIT POINTS

Remediation is a particular challenge for integrated curricula because periods of integrated instruction have to be repeated by students who fail the "resit" examinations as part of the preparation for the repeat examinations. These are important aspects of integrated curricula and definite schedules are required to guide lecturers and students through the programmes, as illustrated here:

a. **Remediation** – Students should be allowed a maximum of **four attempts** at **the Parts I and IV MBBS** examinations and the **Part I and VI BDS** examinations, and a maximum of **three attempts** at **all other parts of the MBBS and BDS** examinations of the two courses.

b. **Exit points** – In schools that have allotted credit units to the constituent courses/disciplines, students who wish to transfer to other undergraduate courses shall have the opportunity to do so using the aggregate credit units they would have acquired. This includes those students who fail to pass the MBBS/BDS examinations after the maximum number of attempts and those wishing to withdraw from the MBBS/BDS courses for other reasons.

BSc Medical Sciences degree – The BSc Medical Sciences programme (where available) is one of the programmes to which students who have to withdraw from the MBBS/BDS programmes may transfer. This degree is usually aimed at students planning careers in health care and health-care-related professions other than medicine.

3.8.4 INSTRUCTION IN THE NATIONAL MBBS/BDS CURRICULUM TEMPLATE

The instruction of medical and dental students in this national curriculum template will be mainly by lecturers of the medical and dental schools. However, students will also interact with lecturers from other faculties and institutes in the universities and their teaching hospitals. In addition, they should have sessions with experts drawn from government and nongovernment agencies and private and corporate industry, and with their alumni (local and international). The medical and dental schools should establish relationships with these units to achieve the objective of producing well-rounded doctors.

3.8.5 ASSESSMENT OF STUDENTS

a. Goals of Assessment

These are:

i. Assessment goals should match clerkship objectives. Assessment goals are to ensure that students have achieved the competences required by the programme. Thus the assessments must be tailored alongside the objectives of the course, and they must test skills needed for successful practice for a young doctor.

ii. The assessment of students under instruction with this curriculum template should be competency-based, that is skills-based. Thus, candidates would be expected to convince the examiners not only that they "know" (understand); they must "know how" and also be able to "show how," that is demonstrate possession of the relevant competence (attitudes, skills, or knowledge) being tested at the level of instruction. In this regard, both "formative" and "summative" methods of evaluation should be employed.

iii. Overall, examination methods must reflect the "Bloom's Taxonomy" of Assessment to ensure that appropriated standards of tests are applied at each level of instruction.

b. Type of Assessment

The types of assessment that shall be used are:

Formative examinations – Formative evaluation ("mock examinations") should be done regularly (e.g., at least once every posting), prior to the summative examinations, to give students non-consequential feedback on their performance to improve their learning. Importantly, these examinations should be similar to the summative tests to prepare the students for the same. (Note: There is evidence that little or no formative assessments take place presently in our medical and dental schools. In advocating that these assessments should play more prominent roles, it is important to note that "end-of-posting tests" are not considered formative examinations, even if students are given feedback on their performance.)

Summative examinations – These are the consequential examinations that will determine the students' progress during the course and will include the MBBS/BDS finals and the continuous assessments.

Term papers – Students should be required to submit a predetermined number of term papers during the course (one per examining department is suggested). Students should be directed to submit each term paper after a prescribed number of hours of either individual or group self-directed learning projects, which will be undertaken at the different levels of instruction and in the different disciplines. The projects should be supervised by academic staff to ensure their quality. To encourage students to acquire deeper understanding and to encourage broad-based learning, the term papers should cover the core, integrated, multidisciplinary, community-oriented, and social aspects of medicine, as well as the medical humanities.

c. Instruments for Assessment

i. Written examinations

- **Multiple choice questions (MCQs)** – A mixture of true/false, the one-answer-in-five option, and extended matching multiple choice questions (EMQs) are suggested.
- **Short answer questions (SAQs)** – These ensure wider content coverage within a shorter space of time compared with long essays. There should, however, be a marking scheme for each question to achieve a more-objective scoring and narrower variability between markers.
- **Long essays** – These questions test in-depth knowledge of specific topics and are essential to ensure a balanced assessment. Similar to SAQs, there should, however, be a marking scheme for each question.

Where possible, conference marking of written papers should be adopted so a conducive marking environment is created for all scorers. It also aids prompt marking.

ii. Clinical examinations

- **Long case/short case** – Despite the subjectivity associated with this traditional clinical examination, it appears to be better suited for situations where resources are limited than poorly organized "objective examinations." The subjectivity may be reduced by developing a marking scheme for each case.
- **Objective structured examinations** – These may either be "clinical" (OSCE) or "practical" (OSPE) and are best in ensuring equivalent testing of a group of students. The classic models, however, are "resource-intensive," especially as multiple "standardized patients/scenarios" need to be created in order to achieve the same variability of testing that traditional long-case/short-case examinations provide. Where possible, computer-assisted OSCE testing is also recommended for improved psychometric properties.

iii. **Picture tests** – These are pictures of clinical entities/scenarios, results of investigations/tests, equipment, etc. This test is often used as a more objective and quicker alternative to short cases. A marking scheme is also required.

iv. **Oral examinations** – The viva voce is still in use in most medical school assessments. The questions should however be structured such that the questions to be answered by the candidate are preset and standardized as much as possible by a group of examiners.

3.9 NATIONAL CURRICULUM TEMPLATE FOR BASIC MEDICAL SCIENCE AND LABORATORY MEDICINE AND PHARMACOLOGY FOR MBBS/BDS

3.9.1 INTRODUCTION

Anatomy, physiology, and biochemistry, which are the core components of the basic medical sciences, provide knowledge that forms the foundation of medical education and practice. The curricula for the basic medical sciences of anatomy, physiology, and biochemistry are fairly consistent throughout Nigeria in terms of the content. But considering the changing nature of medical education and practice, it has become of utmost importance that the curricula of these subjects are re-examined and restructured to enhance the current integrated and evidence-based methods of content delivery. Recently, biochemistry began to undergo changes that adapt it more to clinically important contents. This has been helped by

the encouragement that MDCN has given to medical schools to set up departments of Medical Biochemistry (*Red Book* 2007). Basic medical sciences have, however, expanded to include subjects such as molecular biology, bioinformatics, and medical and animal ethics. The major challenges that basic medical sciences curricula have to contend with are content-delivery methods and supporting infrastructure.

3.9.2 CURRENT STATUS OF BASIC MEDICAL EDUCATION IN NIGERIAN MEDICAL SCHOOLS

Medical education and curriculum, including content-delivery methods, in Nigeria are still largely as they were acquired from British medical educators several decades ago. The type of medical education process is characterized by the following:

i. Didactic lecture style

ii. Minimal horizontal integration between anatomy, physiology, and biochemistry

iii. Minimal audiovisual support and computer-aided teaching

iv. Inconsistent and expensive Internet access

v. Mainly lecturer-centred knowledge exchange, rather than student-centred

vi. Minimal opportunity for students to develop critical thinking and subject analysis

vii. Problem-based learning practiced only in a few institutions

viii. Evidence-based learning foreign to majority of schools

3.9.3 OBJECTIVES OF BASIC MEDICAL SCIENCE EDUCATION

a. General objectives of basic medical science education:

i. Train medical students in the basic medical sciences that are required to fulfill the general objectives of medical and dental education in Nigeria.

ii. Help students see the relevance of the basic sciences subjects to medicine and dentistry and appreciate the synergy in their contribution to medical and dental practice.

iii. Prepare the students to appreciate the scientific basis of medicine and dental practice and development.

iv. Train and motivate medical and dental students in the benefits of postgraduate training and scientific research to international standards.

b. Specific objectives of the task:

i. Reduce the amount of information that students are expected to know by removing or de-emphasizing materials that are specialized in nature and content.

ii. Horizontally integrate subcontents of the subjects of anatomy, biochemistry, and physiology for easy learning and appreciation of the synergy between these subjects.

iii. Make time available for the addition of other subjects that are of importance in current medical practice and research, such as molecular biology, bioinformatics, communication skills, teamwork, medical and animal ethics, and information and communication technology.

iv. Develop the capacity for critical thinking and independent thought processes, which makes for better analysis of clinical situations and research endeavours.

v. Meet global standards for teaching and learning basic medical sciences with a competency-driven outlook.

3.9.4 METHODOLOGY OF REVIEW AND RATIONALE FOR SELECTION

Identified gaps in current methods used for content delivery and infrastructural support systems include:

i. Poor integration of courses.

ii. Lack of focus of deliverables.

iii. Insufficient opportunities for self-development and exhibition of potential abilities in students.

The new curriculum should incorporate the following:

i. Teaching timetable that ensures horizontal integration between gross anatomy, histology, and embryology, and between anatomy, biochemistry, and physiology.

ii. Vertical integration of basic sciences with the clinical sciences.

iii. Achievable outcomes, for each subject, that can and must be assessed at the end of the course.

iv. Student-centred teaching and learning methodology, which encourages students to exercise their potential powers of self-development and subject development, both as undergraduates and after graduation.

v. Development of the ability for oral expression and discourse.

vi. Teaching and learning support facilities, such as ICT, free access to Internet and Intranet services, subscription to free online materials, slide presentation teaching facilities, museum specimens, and adequate and regular supply of laboratory equipment and consumables.

3.9.5 COURSE ASSESSMENT METHODS

In course assessment:

i. Assessment methods require evidence of competence in theory and practice.

ii. Objectives and expected outcomes must be tested for.

iii. Continuous assessment must continue to form a reasonable proportion of examinations (30-40 percent suggested).

iv. Subjective assessment methods, such as viva voce, while of importance as a way of ensuring cross-fertilization of teaching and learning standards through the use of external examiners, should not be over scored.

3.9.6 TEMPLATE FOR REVIEW

The review template seeks to horizontally align the contents of the basic medical sciences curriculum between anatomy, biochemistry, and physiology and insert the additional subjects that are of current relevance and interest to medical practice and research. (See Table 6.)

TABLE 6. REVIEW TEMPLATE

200 Level First Semester		
Anatomy	**Physiology**	**Biochemistry**
General anatomy, nomenclature and definitions; structure, innervations and functions of upper and lower limbs clinical correlates; boundaries contents and functions of the thorax. Embryology- Introduction to embryology; embryonic and fetal periods; molecular regulation of embryonic development; development of viscera of the thorax. Histology- Basic histology of the cell, components functions and specializations. Ultrastructure of the human cell. Introduction to molecular biology; basic histological tissues; histology of viscera of the thorax; relation of microscopic structure to function.	Introductory Physiology/Cell Physiology Excitable Tissues Blood Physiology Respiratory Physiology Cardiovascular Physiology	Introduction to Biochemistry Chemistry of Biological Molecules Metabolism of Biological Molecules I
200 Level Second Semester		
Anatomy	**Physiology**	**Biochemistry**
General anatomy- Boundaries and viscera of abdomen, pelvis, and perineum; structures and viscera of the head and neck. Embryology- Development of body cavities, viscera of abdomen, pelvis, and perineum. Development of viscera of head and neck. Histology- Histology of abdominal, pelvic, and perineal viscera. Histology of viscera of head and neck.	Physiology of Gastrointestinal Tract Renal Physiology Endocrine Physiology Reproductive Physiology Neurophysiology Physiology of Special Senses	Nutrition and Nutritional Biochemistry Endocrinology Xenobiotics and Forensic Biochemistry Introduction to Medical Biotechnology and Bioinformatics Immunochemistry Neurochemistry: Molecular Biology and Genetic Engineering
300 Level First Semester		
Introductory Pathology and Pharmacology Clinical Application of Core Basic Medical Science Human Nutrition and Family Medicine.		
Revision CBS		
First professional examination in anatomy, physiology, biochemistry, clinical application of CBS, human nutrition, and family medicine		

3.9.7 EXPECTED OUTCOMES

The thrust of this curriculum is to shift from the older, teacher-centred learning, characterized by a barrage of information that the student is not able to appropriately process, to one that is student-centred and evidence-based and incorporates new and emerging sciences that impact positively on medical knowledge, practice, and research. Therefore the expected outcomes include the following capabilities by students:

i. Manage the concise content to which they are exposed.

ii. Theoretically and practically demonstrate evidence of clear understanding of knowledge of basic medical science relevant to medical practice.

iii. Demonstrate understanding of the relationship between anatomy, physiology, and biochemistry as the common foundation of medical knowledge.

iv. Correlate basic structure of the human body to physiological and biochemical functions.

v. Correlate knowledge of basic medical sciences to common clinical scenarios.

Tables 7-12 present the National Template learning objectives and desired competencies for the basic medical/dental sciences, laboratory medicine, and pharmacology and therapeutics.

TABLE 7. NATIONAL TEMPLATE LEARNING OBJECTIVES FOR THE BASIC MEDICAL/DENTAL SCIENCES

Learning Objectives	Outcome Indices	Assessment Methods	Teaching Methods
To produce medical graduates who have sufficient knowledge of basic medical sciences for medical education.	Demonstration of a grasp of basic medical sciences with an understanding of the structures, functions, and biochemical mechanisms of the human body.	MCQs SAQs Short and long essays Practical exams *(steeplechase)* *Viva voce*	Didactic teaching Tutorials Practical demonstrations
To introduce students to simple clinical applications of basic medical sciences.	Ability to apply the knowledge of structures, functions, and biochemical mechanisms of the human body to clinical scenarios.	MCQs Short and long essays	Tutorials Case-based learning
To produce medical graduates with a general knowledge of research in basic medical sciences.	Ability to conduct simple biomedical research and interpret the results.	Mini projects Practical examinations	Didactic teaching Practical demonstrations
To produce medical graduates who meet international standards and who possess a sound knowledge of basic medical sciences.	Demonstration of a broad knowledge of basic medical sciences.	MCQs SAQs Short and long essays *Viva voce*	Didactic teaching Tutorials Take-home research assignments
To produce medical graduates with sound ethical behaviour.	Demonstration of sound ethical behaviour, especially in research.	*Viva voce*	Mentoring Tutorials

TABLE 8. NATIONAL TEMPLATE DESIRED COMPETENCES FOR BASIC MEDICAL/DENTAL SCIENCES

Learning Objectives	Outcome Indices	Must Know/ Must Know to Pass 50% Contact Teaching Time	Should Know/ Should Know to Pass 30% Contact Teaching Time	May Know/May Know to Pass 10% Contact Teaching Time
To produce medical graduates who have sufficient knowledge of basic medical sciences for medical education.	Demonstration of a grasp of basic medical sciences with an understanding of the structures, functions, and biochemical mechanisms of the human body.	Normal gross and microscopic structure of the human body structure, chemistry, and physiology of the cell Developmental processes and basic biochemical processes in the human body	Sexual differences in anatomical structures Genetic regulation of cellular metabolism. Functional anatomy of the systems and organs in the human body	Anatomical variants Gene rearrangement and translocation in disease states
To introduce students to simple clinical applications of basic medical sciences.	Ability to apply the knowledge of structures, functions, and biochemical mechanisms of the human body to clinical scenarios.	Anatomical and physiological basis of clinical conditions Clinical importance of enzymes	Clinical outcome of specific aberrations of structure and functions and biochemical processes of the human body	Clinical syndromes Biochemistry of aging
To produce medical graduates with a general knowledge of research in basic medical sciences.	Ability to conduct simple biomedical research and to interpret the results.	Introduction to research methodology	Basic data analysis methods	
To produce medical graduates who meet international standards and who possess a sound knowledge of basic medical sciences.	Demonstration of a broad knowledge of basic medical sciences.	Basic computer skills in getting knowledge online Up-to-date anatomical nomenclature and mechanisms of physiological processes		Application of immuno-therapy
To produce medical graduates with sound ethical behaviour.	Demonstration of sound ethical behaviour, especially in research.	Ethics of scientific research	Unethical practices that should be avoided	

TABLE 9. NATIONAL TEMPLATE LEARNING OBJECTIVES IN LABORATORY MEDICINE

Learning Objectives	Outcome Measures/Indices	Assessment Methods	Teaching Methods
To produce medical graduates with sound knowledge of the basic concepts of laboratory medicine and of the pathogenesis of disease processes.	Adequate understanding and knowledge of the causes, pathogenesis, and pathological manifestations of disease processes.	Traditional methods MCQ SAQs	Lectures Tutorials Problem-based questions Practicum/case review
To produce medical graduates who have a sound knowledge and understanding of basic pathologic processes and mechanisms of diseases and are proficient in the use of laboratory techniques. in the investigation of disease processes.	Demonstration of adequate knowledge of normal values and of basic pathologic processes and mechanisms of diseases. Ability to use microscopes and basic laboratory techniques to diagnose diseases. Ability to recognize gross pathological and clinical anomalies in organ systems.	MCQ SAQs *Viva voce*	Lectures Tutorials Practical classes Practicum/case review
To produce medical graduates with sound theoretical knowledge of pathology with which to effectively sustain their medical practice.	Adequate understanding and knowledge of core pathology processes. Ability to correlate pathological changes with clinical presentations. Ability to interpret abnormal laboratory findings.	Logbook MCQs Essay questions SAQs *Viva voce*	Lectures Tutorials Chart-review meetings Web-based learning Project work Practicing/case review
To produce medical graduates who are able to apply their knowledge of infectious disease pathology to adequately contribute to national and international community control programmes aimed at promoting public health.	Adequate knowledge of infectious disease processes. Ability to apply laboratory techniques in the diagnosis and management of infectious diseases.	MCQ SAQs Essay questions *Viva voce*	Lectures Web-based learning Tutorial Chart-review meetings Practicum/case review

TABLE 10. NATIONAL TEMPLATE DESIRED COMPETENCES FOR LABORATORY MEDICINE

Learning Objectives	Outcome Indices	Must Know/ Must Know to Pass 50% Contact Teaching Time	Should Know/ Should Know to Pass 30% Contact Teaching Time	May Know/ May Know to Pass 10% Contact Teaching Time
To produce medical graduates with sound knowledge of basic concepts of laboratory medicine and of the pathogenesis of disease process.	Demonstration of adequate understanding and knowledge of the aetiology (infective and non-infective causes), risk factors, pathogenesis and pathological manifestations of disease processes.	Causes, risk factors, physical/clinical manifestations of various diseases Appropriate specimens and laboratory tests to investigate diseases	Cellular and biochemical changes in diseases Types and manifestation of congenital disorders Morphology of infective agents The defence mechanism in host-parasite relationship Bacterial speciation based on biochemical tests	Inheritable disorders Diagnosis of clinically uncommon infections Molecular basis of haematological and infectious diseases Laboratory equipment required in the various clinical laboratories
To produce medical graduates who have a good understanding of and are proficient in the use of clinical laboratory techniques in the investigation of disease processes.	Be able to order clinically appropriate and relevant tests. Recognition of gross organ changes in disease. Knowledge of the pathogenesis of diseases to guide choice of appropriate tests ordering.	Ability to order clinically appropriate and relevant tests toward institution of appropriate management modalities	Interpret result of common laboratory investigations Treatment of malignancies and infectious diseases	Detailed knowledge of specific drug-drug interactions and management of the various complications
To produce medical graduates with sound theoretical and practical knowledge of anatomical pathology, chemical pathology, haematology, and medical microbiology and parasitology to effectively sustain their medical practice.	Ability to effectively apply their knowledge of laboratory medicine in management of patients and disease control programmes at local, national, and international levels.	Interpretation of results of common biochemical and other laboratory investigations Normal values Principles of chemotherapy and drug abuse Development of drug resistance Nosocomial infections	Clinico-pathologic correlations Interpretation of less-common laboratory tests Mechanism of action of drugs used for haematological disorders Principles and mechanism of antibiotic resistance	Haemovigilance. Basic statistical tools applied to laboratory data
To produce medical graduates who meet international standards and who are proficient in planning effective national and international health	Ability to contribute to the planning and preventive disease control programmes locally, nationally, and internationally.	Basic computer skills in acquisition of knowledge for the prevention and control of diseases (both infective and non-infective)	Prevention and control of major diseases that are prevalent locally	Application of immunotherapy and molecular methods in control of diseases

Learning Objectives	Outcome Indices	Must Know/ Must Know to Pass 50% Contact Teaching Time	Should Know/ Should Know to Pass 30% Contact Teaching Time	May Know/ May Know to Pass 10% Contact Teaching Time
control programmes aimed at promoting public health.		Blood transmissible diseases and prevention		
To produce medical graduates with sound ethical behaviour and adequate knowledge of molecular biology and its application in pathogenesis, prevention, management and control of diseases, and disease processes.	Ability to interpret results of molecular tests Ability to use appropriate biotechnology in the management and control of diseases.	Ethics of scientific research What constitute responsible clinical practice	Unethical practices that should be avoided	Principles of molecular tests Bioinformatics and troubleshooting various molecular tests

TABLE 11. NATIONAL TEMPLATE LEARNING METHODS FOR PHARMACOLOGY AND THERAPEUTICS

Learning Objectives	Outcome Measures/Indices	Assessment Methods	Teaching Methods
To produce medical graduates who have sufficient knowledge of basic pharmacology.	What constitutes a drug/medication. Uses, history, and sources of drugs.	MCQs Long and short essay questions in continuous assessment (CA) and final examinations Practical examination/steeplechase Orals	Lectures Tutorials Practical demonstrations Practicum/case review
To produce medical graduates who have adequate orientation towards the application of basic medical science in clinical practice.	Theoretical knowledge of the mechanism of drug action.	MCQs Long and short essay questions in CAs and final examinations Practical examination/steeplechase Orals	Lectures Tutorials Practical demonstrations Practicum/case review
To produce medical graduates with basic research methodology.	Theoretical knowledge of how humans dispose of drugs (pharmacokinetics).	MCQs Long and short essay questions in CAs and final examinations Practical examination/steeplechase Orals	Lectures Tutorials Practical demonstrations Practicum/case review
To produce medical graduates who have sound knowledge of basic medical sciences of international standards.		MCQs Long and short essay questions in CAs and final examinations Practical examination/steeplechase Orals	Lectures Tutorials Practical demonstrations Practicum/case review

TABLE 12. NATIONAL TEMPLATE DESIRED COMPETENCIES FOR PHARMACOLOGY AND THERAPEUTICS

Learning Objective	Outcome Indices	Must Know/Must Know to Pass 50% Contact Teaching Time	Should Know/ Should Know to Pass 50% Contact Teaching Time	May Know/ May Know to Pass 50% Contact Teaching Time
To produce medical graduates who have sufficient knowledge of basic pharmacology.	What constitutes a drug/medication. Uses, history and sources of drugs.	Sources of drugs and drug information Routes of drug administration Advantages and constraints Cholinergic and adrenergic transmission and neurotransmitters	Transport across bio-membranes and related factors	Molecular details of drug-receptor interaction
To produce medical graduates who have adequate orientation towards application of basic medical science in clinical practice.	Theoretical knowledge of the mechanism of drug actions.	What constitutes chemotherapy Classes and commonly used chemotherapeutic agents in the social-ecological environment	Interpretation of log dose-response curve General knowledge of the management of drug interactions	Detailed knowledge of specific drug-drug interactions, including how to manage in clinical practice
To produce medical graduates with basic research methodology	Theoretical knowledge of how humans dispose of drugs (pharmacokinetics).	Drugs for treatment of common systemic/organ disorders in the immediate environment	Clinical pharmacology of specific drugs used for common disorders of CVS, CNS, etc.	Principles of post-marketing surveillance of approved drugs
To produce medical graduates who have sound knowledge of basic medical science at international standards		Recognize adverse effects and have general knowledge of essential drug lists Principles of management of drug poisoning and drug interactions	National policy and treatment guidelines of common disorders (e.g., malaria) Specific antidotes for common poisons	Ability to design essential drug list

3.10 ASSESSMENT METHODS FOR THE INTEGRATED BASIC MEDICAL AND DENTAL SCIENCES

It is generally believed that assessment derives learning; the importance of appropriate assessment methods in the integrated medical curriculum cannot therefore be overemphasized. Consequent upon this, the assessment methods shown in Tables 13-16 are proposed for the integrated medical curriculum in anatomy, biochemistry, physiology, pathology, and pharmacology. Both formative and summative assessments should count directly or indirectly in the training and assessment of students under the integrated medical curriculum.

TABLE 13. ASSESSMENT METHODS IN ANATOMY FOR MEDICINE AND DENTISTRY

Semester/Type	Posting
200L (1st Semester)	**Integrated Core Basic Medical Sciences**
Formative assessment	*Viva voce* for practical, steeplechase, SAQs
Summative assessment	SAQs, MCQs, term papers
200L (2nd Semester)	**Integrated Core Basic Medical Sciences**
Formative assessment	*Viva voce* for practical, steeplechase, SAQs
Summative assessment	SAQs, MCQs, term papers
300L (1st Semester)	**Integrated Applied Basic Medical Sciences**
Formative assessment	MCQs, SEQ, LEQ, steeplechase, practical examination, *viva voce*
Summative assessment	MCQs, SEQ, LEQ, steeplechase, practical examination, *viva voce*, continuous assessment

TABLE 14. ASSESSMENT METHODS IN PHYSIOLOGY AND BIOCHEMISTRY FOR MEDICINE AND DENTISTRY

Semester/Type	Posting
200L (1st Semester)	**Integrated Core Basic Medical Sciences**
Formative assessment	Term paper, mini-project, literature review, seminar
Summative assessment	MCQ, SEQ, LEQ
200L (2nd Semester)	**Integrated Core Basic Medical Sciences**
Formative assessment	Term paper mini-project, literature review, seminar
Summative assessment	MCQ, SEQ, LEQ
300L (1st Semester)	**Integrated Applied Basic Medical Sciences**
Formative assessment	Term paper, mini-project, literature review, seminar
Summative assessment	MCQs, SEQ, LEQ, steeplechase, practical examination, *viva voce*, continuous assessment

TABLE 15. ASSESSMENT METHODS IN LABORATORY MEDICINE FOR MEDICINE AND DENTISTRY

Semester/Type	Posting
300L (1st Semester)	**Integrated Block Posting I**
Formative assessment	Integrated OSPE, SAQ, portfolio
Summative assessment	MCQ, SAQ, portfolio
300L (2nd Semester)	**Integrated Block Posting II**
Formative assessment	Core/integrated SAQ, MCQ, portfolio
Summative assessment	Core/integrated, MCQ, SAQ, portfolio
400L (1stand 2nd Semesters)	**Core Lectures/Infectious Diseases Posting**
Formative assessment	Core/integrated OSCE, SAQ, portfolio
Summative assessment	Core/integrated SAQ, portfolio
500L (1stand 2nd Semesters)	**Integrated Revision Block Posting**
Formative assessment	Integrated OSPE, SAQ, portfolio
Summative assessment	Integrated long essay, MCQ, SAQ, viva voce, portfolio, practical examination, continuous assessments
600L (2nd Semester)	**Medicine III (Lectures)**
Formative assessment	None
Summative assessment	Core/integrated SAQ, MCQ, LEQ, OSCE, picture, viva voce, continuous assessment

TABLE 16. ASSESSMENT METHODS IN PHARMACOLOGY AND THERAPEUTICS FOR MEDICINE AND DENTISTRY

Semester/Type	Posting
300 L (1st Semester)	**Integrated Block Posting I**
Formative assessment	Integrated OSPE, SAQ, portfolio
Summative assessment	MCQ, SAQ, portfolio
300 L (2nd Semester)	**Integrated Block Posting II**
Formative assessment	Core/integrated SAQ, MCQ, portfolio
Summative assessment	Core/integrated MCQ, portfolio
400 L (1st and 2nd Semesters)	**Core Lectures/Infectious Diseases Posting**
Formative assessment	Core/integrated OSCE, SAQ, portfolio
Summative assessment	Core/integrated SAQ, portfolio
500 L (1st and 2nd Semesters)	**Integrated Revision Block Posting**
Formative assessment	Integrated OSPE, SAQ, portfolio
Integrated long essay, MCQ, SAQ, viva voce, portfolio, practical examination (slides/pots/photomicrographs)	

3.11 CONCLUSIONS

The basic medical science curriculum in Nigeria is still largely as it was inherited from the British medical teachers. Modifying the contents to add new and emerging sciences that are of immense importance to medical research and practice, setting up general and specific objectives that ensure evidence-based and competency-driven curriculum, and entrenching/establishing fully integrated teaching and learning processes will be of profound benefit to learners, practitioners, and the end receivers of health care.

3.12 NATIONAL CURRICULUM TEMPLATE FOR CLINICAL SCIENCES (MEDICINE)

3.12.1 INTRODUCTION

Clinical training is the cornerstone of medical education in the twenty-first century. As the country's health care system becomes more complex, there is a need to establish systems for providing primary care that are evidence-based and patient-centred. The clinical training will emphasize problem solving within the context of good patient care, preventive medicine, and ethical concerns.

3.12.2 STATUS OF CLINICAL SCIENCES CURRICULUM IN NIGERIAN SCHOOLS

Most of the medical schools in Nigeria are using outdated curricula for the clinical sciences, mainly modelled after the British system of medical education. Prompted by the need to meet global best practice standards, the medical colleges/schools curricula in Nigeria will continue to undergo evaluation to emphasize a problem-oriented, organ-system-based approach, starting from the preclinical years. Ongoing changes in the curricula are designed to help students become active and independent learners and thinkers.

3.12.3 METHODOLOGY

To accomplish these objectives and also meet global best practices in clinical medicine, there is a growing need to facilitate the transition from preclinical to clinical sciences in medical colleges. Since no formal curriculum can prepare students for every patient problem encountered, "evidence-based medicine" will be introduced in the respective clinical clerkships using structured exercises to stimulate active learning. Clinical problems and experiences will be used as the basis for further exploration of the scientific foundations of the health care system.

3.12.4 OBJECTIVES

The overall goal in the clinical years is to train students to be well-rounded physicians after graduation, possessing the ability to think critically while using their clinical skills to function as generalists. In light of this goal, following the "Introduction to Clinical Science," which begins in the first semester of the 300 level, at the 400 level students should begin "a more intensive exposure to clinical and applied medicine" as practiced in the wards, out-patient clinics, surgical operating theatres, radiologic units, etc. Efforts should be directed at ensuring that students, over time, become competent in the following skills:

- Techniques in medical history-taking, physical examination, and clinical reasoning
- Interpretation of laboratory data into the clinical decision-making process

- Management approach to common out-patient and in-patient conditions in the medical and surgical specialties
- In-depth knowledge of the aetiology, pathophysiology, and clinical features of common disorders
- Performance of common out-patient and in-patient diagnostic procedures
- Performance of common emergency and elective surgical procedures appropriate for the level
- Application of culturally appropriate methods to guide patients to achieve reproductive and sexual health

3.12.5 TEMPLATE

The University of Ibadan revised curriculum for MBBS training in clinical sciences is advocated for use as the template for all medical schools in Nigeria. Individual institutions can modify various aspects depending on the needs and available manpower as long as the benchmark standards of the NUC and MDCN are met. The core specialties in clinical sciences are medicine, surgery, obstetrics and gynaecology, paediatrics, community health (public health), mental health, radiology/radiotherapy and oncology, clinical pharmacology, and therapeutics. Other specialties include surgical (otorhino-laryngology, ophthalmology, anaesthesiology) and family medicine/general medical practice. Infectious diseases and tropical medicine, geriatrics, rheumatology, and emergency medicine deserve adequate coverage in every training curriculum because of relevance, the aging population, and global interest.

There are additional courses that should be included in the clinical sciences curriculum because they are interwoven into the comprehensive training of doctors. These allied courses are medical jurisprudence, management and entrepreneurship, medical humanities/communication art, educational methods and technology, medical ethics, medical sociology, human nutrition, palliative care and end-of-life issues, biotechnology, bioinformatics, alternative/traditional medicine, and computers in medicine.

3.12.6 TEACHING AND ASSESSMENT METHODS

A wide variety of teaching methods/formats already in use – including didactic lectures, tutorials, seminars, workshops, and e-learning materials for independent learning and lectures – will be enhanced. Besides the demonstration of cases, case-based teaching will also be utilized, as well as slide shows. Telemedicine facilities will be used for relevant specialties, such as radiology, oncology, medicine, surgery, paediatrics, and obstetrics and gynaecology. The clinical years will integrate elements of history-taking, physical examination, and diagnostic reasoning to provide students with a realistic and comprehensive approach to patient encounters. The hands-on learning during the clinical years is an ideal complement to the basic science courses. Clinical students should also be exposed to special and guest lectures when the opportunities arise. In addition, clinical students will participate in mini projects and carry out homework assignments.

Both formative and summative assessments will be utilized for monitoring training. The formative assessment format can be left to individual institutions to design, and erring students can be counselled before too large a gap in training results in a bad outcome. Attendance is important, and students should sign up for every activity or teaching encounter.

Summative assessment, which counts towards successful completion of each course, will comprise theory papers, MCQs, SAQs, and LEQs. The suggested clinical examination can be in the form of OSCE, long cases for some specialties, picture test for some specialties, and viva voce, which could also be designed as part of the OSCE. Continuous assessment should include marking projects, term papers, and portfolios.

Tables 17-19 present the National Template learning objectives, desired competencies, and assessment methods for clinical sciences in medicine.

TABLE. 17. NATIONAL TEMPLATE LEARNING OBJECTIVES FOR CLINICAL SCIENCES IN MEDICINE

Learning Objectives	Outcome Indices	Assessment Methods	Teaching Methods
To produce medical graduates who are well equipped to effectively diagnose and manage common emergencies presenting in adults and children.	Demonstration of adequate knowledge and appropriate skills in cardiopulmonary resuscitation, history-taking, and the ability to elicit clinical signs to diagnose common emergencies presenting in adults and children.	Logbook/posting booklet Clinical examination Oral examination OSCE Essays Case presentations MCQs Formative assessment	Didactic methods Bedside teaching Case demonstrations Tutorials Case studies Chart-review meetings
To produce medical graduates who are competent to effectively diagnose and manage medical conditions/diseases that are prevalent among adults and children in Nigeria.	Demonstration of adequate theoretical knowledge of the pathogenesis, clinical presentation, treatment, and complications of common diseases in the subregion. Demonstration of appropriate bedside manners and competent skills in history-taking and physical examination and the ability to arrive at a set of logical differential diagnoses as well as formulate management plans.	Case presentations Picture test Clinical examination OSCE Viva voce Logbook Formative assessment Case write-ups SAQs	Didactic lectures Tutorials Bedside teachings Case demonstrations
To produce medical doctors who display a sound understanding of the environment in which they practice, pay adequate attention to the socioeconomic and cultural factors that affect human health, and attend to their patients in a socially responsive manner.	Demonstration of the ability to relate socioeconomic factors to disease pathogenesis. Possession of appropriate skills in counselling patients and caregivers on simple and preventive measures the management of technology for common diseases.	Social seminars Essays Logbooks for community postings Case presentations MCQs SAQs *Viva voce*	Grand round Social clinical Seminars Bedside teachings Tutorials
To produce medical doctors who are skilled in performing basic diagnostic and therapeutic procedures in medical practice.	Demonstration of the ability to perform simple diagnostic procedures.	Clinical examination *Viva voce* Picture test OSCE	Bedside teachings Tutorials Web-based learning

Learning Objectives	Outcome Indices	Assessment Methods	Teaching Methods
To produce medical graduates who measure up to international standards in soundness of training, medical knowledge, skills, and competence.	Demonstration of a broad knowledge of medicine. Demonstration of the ability to identify differences in management options of common diseases. Identify conditions resulting from limited resources.	MCQs SAQs *Viva voce*	Bedside teachings Emergency room calls Ward rounds
To produce medical graduates with sound ethical behaviour.	Demonstration of ethical behaviour and professionalism.	Clinical long case *Viva voce*	Tutorials Bedside teachings Ward round

TABLE 18. NATIONAL TEMPLATE DESIRED COMPETENCES FOR CLINICAL SCIENCES IN MEDICINE

Learning Objectives	Outcome Indices	Must Know/ Must Know to Pass 50% Contact Teaching Time	Should Know/ Should Know to Pass 30% Contact Teaching Time	May Know/May Know to Pass 10% Contact Teaching Time
To produce medical graduates who are well equipped to effectively diagnose and manage common emergencies presenting in children and adults.	Demonstration of adequate knowledge and appropriate skills to diagnose and institute initial management of common emergencies seen in children and adults in general practice.	Able to skillfully diagnose common emergencies seen in children and adults Able to institute life-saving measures in emergencies, particularly in severe anaemia, shock, dehydration, and cardio-pulmonary arrest Able to perform effective CPR	Role of ACLS in children and adults Able to chart course of management after initial resuscitation Make appropriate referrals to ensure appropriate further management	Skills for ACLS and PALS
To produce medical graduates who are competent to effectively diagnose and manage diseases that are prevalent among children and adults in Nigeria.	Demonstration of adequate theoretical knowledge of the pathogenesis, clinical presentation, treatment, and complications of common diseases that in the country. Ability to arrive at a set of logical differential diagnoses as well as formulate management plans.	Skillful history-taking and physical examination Synthesis of history and physical findings into a set of logical differential diagnoses of common diseases Order appropriate investigations and correctly interpret the results to arrive at definitive diagnoses Institute appropriate management of common diseases	Anticipate, recognize, and manage complications of common diseases	Diagnosis of uncommon diseases and their management

Learning Objectives	Outcome Indices	Must Know/ Must Know to Pass 50% Contact Teaching Time	Should Know/ Should Know to Pass 30% Contact Teaching Time	May Know/May Know to Pass 10% Contact Teaching Time
To produce medical graduates who display a sound understanding of the environment in which they practice, pay adequate attention to the socioeconomic and cultural factors that affect human health, and attend to their patients in a socially -responsive manner	Demonstration of the ability to relate socioeconomic and cultural factors to disease pathogenesis and management. Possession of appropriate skills in counselling patients and caregivers on simple health-related technology for prevention and treatment of common diseases.	Ability to recognize and appreciate the role of socioeconomic and cultural factors in the causation and course of diseases Understand the influence of social factors in disease management Demonstrate adequate counselling skills Apply simple, health-related technology in interventions for health promotion and disease prevention and management Understand the use of CAM in management of diseases	Knowledge of the prevailing cultural beliefs and practices in the various parts of the country and their influence on health Ability to instil a change in health-seeking behaviour of patients through adequate counselling	Understand influence of other cultures on health
To produce medical doctors who are skilled in performing basic diagnostic and therapeutic procedures in medical practice.	Demonstration of the ability to perform simple diagnostic and therapeutic procedures.	Ability to perform simple diagnostic procedures Ability to make appropriate inferences from results of such investigations Ability to institute appropriate treatment based on the results	Ability to perform simple therapeutic procedures	Interpretation of complex investigation results
To produce medical graduates who measure up to global standards in soundness of training, medical knowledge, skills, and competence.	Demonstration of a broad knowledge of medicine. Demonstration of the ability to identify differences in management options of common diseases. Identify conditions resulting from limited resources.	Demonstration of a sound knowledge of a wide range of current treatment options available for common diseases	Possession of knowledge and skills of global standards	Ability to work in a wide range of settings

Learning Objectives	Outcome Indices	Must Know/ Must Know to Pass 50% Contact Teaching Time	Should Know/ Should Know to Pass 30% Contact Teaching Time	May Know/May Know to Pass 10% Contact Teaching Time
To produce medical graduates with sound ethical behaviour.	Demonstration of ethical behaviour and professionalism. Demonstration of appropriate bedside manners and competent skills in history-taking and physical examination.	Demonstration of empathy and commitment to patient care Social responsiveness and accountability in the care of patients		

TABLE 19. NATIONAL TEMPLATE ASSESSMENT METHODS IN CLINICAL SCIENCES FOR MEDICINE

Semester/Type	Posting
300 L (1st Semester)	**Integrated Applied Basic Science**
Formative assessment	MCQ, core/integrated SAQ
Summative assessment	MCQ, SAQ
300 L (2nd Semester)	**Integrated Clinical Posting I**
Formative assessment	Portfolio, OSPE, picture test, SAQ, viva voce
Summative assessment	Portfolio, OSPE, MCQ
400 L (1stand 2nd Semesters)	**Medicine II/Core Lectures**
Formative assessment	Core/integrated, OSCE/SAQ, portfolio, viva voce
Summative assessment	OSCE, MCQ, logbook, long case, SAQs
600 L (2nd Semester)	**Revision Clinical Postings**
Formative assessment	Portfolio, long case/short case, viva voce, picture test, OSPE
Summative assessment	Portfolio, MCQ, Long essays/Short essays, viva voce, Picture test, OSCE, Term Paper

3.12.7 CONCLUSION

Clinical training should be a systematic approach that ensures the progressive development of clinical skills and reasoning and the practice of patient-centred care, from the beginning of the clinical years through graduation from medical school. Early introduction of the students to clinical sciences during the period of instructions in basic sciences is recommended, as well as early exposure to community medicine. The product must be able to diagnose medical and surgical conditions, be competent in managing medical and surgical emergencies, demonstrate competence in performing simple diagnostic procedures, have acquired skills in verbal and nonverbal communication with patients and their relatives, meet international standards, and be competitive while demonstrating sound ethical behaviour.

3.13 NATIONAL CURRICULUM TEMPLATE FOR COMMUNITY MEDICINE AND PHC/PREVENTIVE AND SOCIAL MEDICINE

3.13.1 INTRODUCTION

There is need to review our medical education system with regard to our environmental and community realities, while remaining globally relevant. The common disease presentations are changing from a predominantly infectious disease to non-communicable or a complex of both. Globalization has reduced travel time, thus infections hitherto uncommon in our environment are now becoming common, meaning that the needs of clients also are changing. In reviewing the Community Medicine/Preventive and Social Medicine component of the new curriculum, the above considerations have been kept in view.

3.13.2 AIMS AND OBJECTIVES OF COMMUNITY MEDICINE POSTING

The overall aims of the undergraduate training in Community Medicine are as follows:

- Introduce students to the concept of community health and its relevance in the health care delivery system of Nigeria.
- Equip 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.
- Equip students 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 to reduce mortality and morbidity in the community, as well as to improve the quality of life generally.
- Develop a spirit of teamwork in promoting health in all population groups of Nigeria.
- Provide doctors with managerial skills and that can enable them play leadership roles in the health team.

3.13.2.1 OBJECTIVES OF THIS REVIEW

The objectives of the review are to:

- Encourage better understanding and application of basic sciences in the identification, prevention, and management of public health problems in the community.
- Develop critical thinking and clinical reasoning processes that will encourage students to examine new ideas and solutions to public health issues and problems.
- Meet the global standards of public health teaching and practice.
- Standardize the teaching and assessment of community medicine in the country.

3.13.3 METHODOLOGY OF REVIEW AND RATIONALE FOR SELECTION

The following factors were considered in selecting the philosophy for this updated curriculum:

- Various types and methods of integration of courses.
- Characteristics of Nigerian students and their pre-university learning skills (through literature search).
- Characteristics of Nigerian university lecturers and their teaching skills (through literature search and discussion with colleagues and the Association of Public Health Physicians of Nigeria).
- Learning and teaching environment in Nigeria, especially library and other infrastructure and materials required for self-directed learning.
- Implementation process and anticipated challenges.
- Evaluation of the clinical and community environments in the country (used for rural postings).

Tables 20-22 presents the National Template learning objectives for the clinical sciences in in medicine, desired competencies for community medicine and PHC for MBBS, and assessment methods for community medicine and PHC for medicine, respectively.

TABLE 20. NATIONAL TEMPLATE LEARNING OBJECTIVES FOR THE CLINICAL SCIENCES IN MEDICINE

Topic	Content	Learning Objectives	Teaching Methods	Assessment Methods
200 LEVEL				
History of Medicine in Nigeria	1. Evolution of health care delivery in Nigeria 2. Traditional health system 3. Modern health system	The aim of this course is to help the students understand the evolution of health care delivery in Nigeria from the pre-colonial era to contemporary time.	Didactic lecture Case study of other systems	MCQ and essay
Human Ecology and Medical Sociology	1. The concept of the ecosystem 2. Human ecosystem 3. Components of the environment 4. Food chain 5. Human organizations and systems 6. Behavioural concepts in public health 7. Classification of health behaviour and practices	To demonstrate the relationship between man and his physical and social environment and to describe human behaviour by individuals in the community in response to health challenges in the environment.	Didactic lecture Small group discussions	MCQ, essay, and computer-aided OSCE

Topic	Content	Learning Objectives	Teaching Methods	Assessment Methods
	8. The community as a laboratory 9. Change processes			
Behavioural Sciences and Community Health	1. The structure and function of society 2. Family structure and patterns, marriage, and family institutions 3. Functions of the family, family structure, and health 4. Culture and health	The students will be able to describe how family structures and bonding are designed to manage health crises in the family.	Lecture with discussion	Continuous assessment comprising MCQ and essay
Introduction to Descriptive Statistics	1. Role of statistics in medicine 2. Organization of data and scales of measurements 3. Presentation of data 4. Measurement of central tendency and dispersion 5. Normal dis-tribution curve 6. Estimating population variance	Students should be able to appreciate the importance and relevance of data in community health. They will be able to summarize and present data, as well as understand normal distribution of data in the population.	Didactic lecture Hands-on sessions on data management, organization, and presentation	Data presentation and descriptive statistical analysis of data
300 LEVEL				
Environmental Health	1. Components of environ-mental health 2. Water supply and health 3. Waste (sewage and refuse) management 4. Housing and health, including legislation 5. Food hygiene and market sanitation 6. Air pollution: sources, effects and control 7. Noise and health: sources, effects, and control 8. Control of vectors	Students should be able to understand some of the factors that are essential to good health: good housing, safe water supply, good waste disposal, clean air, food hygiene. The course will help the students appreciate that implementing environmental health involves legislation and enforcement.	Didactic lecture Field trips to municipal solid waste and sewage management departments Field trip to food safety and inspection services departments of the MoH	MCQ, essay and report from field trip

Topic	Content	Learning Objectives	Teaching Methods	Assessment Methods
Introduction to PHC	1. History of PHC 2. Objectives of PHC 3. Principles and Components of PHC 4. Organization of PHC in Nigeria 5. Implementation machinery for PHC. 6. Challenges	Students will be able to describe the need for orienting the health system to PHC as well as describe previous attempts at PHC, the basic components of PHC, and organization of PHC services.	Didactic lecture Field trip to PHC departments in the MoH	Assessment of group community-based PHC service rendered
Introduction to Demography	1. Sources of population data 2. Sources of health and vital statistics 3. Measurement of fertility and mortality 4. Standardization of vital rates 5. Population dynamics structure and growth 6. Interaction between medical action, population, health, and population growth	At the end of this course the students shall be expected to know the definition and explanation of simple demographic terminologies; describe the various types of population pyramids and explain reasons for their differences; discuss the relationship between population, health, and social and economic development; and define, explain, and compute simple demographic and vital statistics.	Introductory lecture Mini survey of the age structure of a defined community Review of population data	MCQ and essay
Health Education/ Promotion	1. Identification of learning needs 2. Planning health education for individual groups and communities 3. Principles of communication, selection, and production of appropriate communication and educational aids	The aim of this course is to instruct trainees on the concepts of health education and health promotion, the objectives of health education, the processes by which adults adopt new ideas and practices, and the methods of health education. They shall also be introduced to behaviour change theories, functions of a health educator, roles of health education, and health promotion in health care delivery.	Lecture with discussion Demonstration of IEC materials Students to give health-promotional talks at PHC centres on different topics Peer review of activities	Assessment of the application of health education skills in developing strategies to communicate health educational messages

Topic	Content	Learning Objectives	Teaching Methods	Assessment Methods
400 LEVEL				
Principles of Epidemiology	1. Definition and basic principles of epidemiology 2. Spectrum of health and disease 3. Types of epidemiological studies 4. Measures of diseases frequency prevalence and incidence rates 5. Sources of morbidity and mortality data 6. Concept of epidemicity, endemicity, and pandemicity 7. Screening for diseases, evaluation of screening and diagnostic tests 8. Investigation of epidemic 9. International classification of diseases, injuries, and causes of death 10. Levels of disease prevention 11. Notifiable diseases 12. Disease surveillance	Students should be able to define epidemiology and discuss its general principles, comment on the application of epidemiology to medicine and community health, differentiate between cause, risk factors, and determinants of diseases, calculate various indices for measuring disease occurrence, describe and apply epidemiological techniques to disease investigation, describe levels of disease prevention, and know national notifiable diseases, means of notification, and disease surveillance.	Didactic lecture Field trip to epidemiology unit, State Ministry of Health surveillance officer and local government council. Review of DSN reports Case studies	MCQ and essay
Health Management	1. Levels of management and functions of managers at the various levels 2. Principles of management 3. Organizational structure at various levels of care 4. Composition and function of the health team.	Students shall be able to define health management and shall learn the application of basic management principles of planning, implementation, and evaluation of health care delivery. They shall be able to describe the organization of health care delivery and the function of the health care team.	Didactic lecture Case studies of systems that do or don't work.	MCQ and Essay

Topic	Content	Learning Objectives	Teaching Methods	Assessment Methods
Family Health	1. Objectives and organization and planning of family health services 2. Component of family health services, including antenatal care, breastfeeding, family planning counselling and services, and immunization 3. Adolescent health	Students shall learn the rationale for family health; understand the special needs of mothers, children, and adolescents; describe the health challenges of mothers, children, and adolescents; identify approaches to prevent, and manage the common health challenges; and promote the health and well-being of mothers, children, and adolescents.	Didactic lecture Urban PHC experience Vaccination of children Report-back sessions	Assessment of the number and quality of vaccinations administered and counselling on family planning
School Health Services	1. School-age child 2. Health problems of a school-aged child 3. School health services	The aim of this course is to highlight the health problems of the school-aged child and demonstrate how school health services can meet these needs.	Lecture with discussion Visits to schools Observation of health status: growth, nutritional state, etc.	Assessment of school health programme executed
Inferential Biostatistics	1. Introduction to probability theory and inductive statistics 2. Tests of significance: • Normal • Distribution • Z-test • Students t-test • Binomial test • Chi Square test 3. Association, correlation, and regression.	Students shall learn how to test for significant differences between populations and samples and know how to interpret p value.	Didactic lecture Assignments on statistics	Post course Statistics test
Occupational Health	1. History of occupational health 2. The environment of working places 3. Common occupational health problems in Nigeria and their control	Students shall be able to appreciate the effect of work on man, describe the principles and elements of occupational health, identify hazards associated with common occupations in Nigeria, and understand various strategies available in	Didactic lecture Field trip for occupational health experience	Assessment of report from field trip

Topic	Content	Learning Objectives	Teaching Methods	Assessment Methods
		making the workplace safe. They will also be able to appreciate the national and international regulations guiding the provision of occupational health.		
Communicable Diseases	1. Concept of epidemiologic triangle of agent, environment, and host 2. Principles of disease control 3. Principles of disease eradication 4. Epidemiology and control of locally endemic communicable diseases 5. Point source verses propagated epidemic 6. WHO special programme for tropical diseases	This course aims at defining the common terminologies in the epidemiology of communicable diseases, describing the concept of the epidemiologic triangle, identifying the routes of transmission of these diseases, highlighting the general principles of disease control and eradication, and describing the epidemic curves.	Didactic lecture Tutorials Seminars Use of museum materials for demonstration	MCQ, essay, steeplechase, and computer-aided OSCE
500 LEVEL				
Research Methods in Public Health	1. Formulation of hypothesis 2. Designing of surveys 3. Sampling methods 4. Questionnaire design 5. Data collection, analysis, and interpretation	The aim of this course is to describe approaches to generating research questions and identifying appropriate epidemiological design and scientific means for data collection, collation, analysis, and interpre-tation of the data.	Application of statistical and epidemiological methods in research design, implementation, analysis, and data interpretation	Assessment of research report
Non-Communicable Diseases Epidemiology	1. Principles of control of non-communicable diseases 2. Prevention and control of non-communicable diseases	Students shall be able to describe the principles of the prevention and control of non-communicable diseases.	Didactic lecture Tutorials Seminars Demonstration with materials from the public health museum	MCQ, essay, steeplechase, and computer-aided OSCE

Topic	Content	Learning Objectives	Teaching Methods	Assessment Methods
Public Health Nutrition	1. Nutrition and health 2. Epidemiology and control of common nutritional problems in Nigeria 3. Infection and nutrition 4. Nutritional values of common Nigerian food items 5. Common nutritional problems in Nigeria 6. Food policy, hygiene, and toxicology 7. Assessment of nutritional status 8. Nutrition education	Students shall be able to identity nutrients and their food sources and appreciate the role of nutrition in public health. The course will also highlight the common nutritional health problems in Nigeria and nutritional requirements for special groups of people in the community.	Didactic lecture Food demonstrations at MCH clinics	MCQ, essay, steeplechase, and computer-aided OSCE
Health Economics	1. Sources of health care funding 2. National health care financing and National Health Account 3. National Health Insurance Scheme 4. Economic evaluation of health programmes	Students shall be able to describe the sources of funding of health care services in Nigeria, with particular emphasis on the National Health Insurance Scheme. They shall also be able to describe economic evaluation of health programmes and understand the types of evaluation, including cost-benefit analysis, cost-effectiveness analysis, and cost-utility analysis.	Didactic lecture Experience sharing with an HMO	MCQ and essay
Epidemiology of Zoonoses	1. Definition and types of zoonoses 2. Prevention and control of common zoonoses	The students shall understand the types of zoonoses and methods for prevention and control of common zoonoses in Nigeria.	Didactic lecture Seminars Tutorials	MCQ, essay, steeplechase, and computer-aided OSCE

Topic	Content	Learning Objectives	Teaching Methods	Assessment Methods
600 LEVEL				
Social Medicine	1. History of social medicine 2. The under-privileged members of society 3. Classification and causes of handicaps. 4. Programmes for the handicapped 5. Social welfare services in Nigeria and other countries.	Students shall be able to describe the causes of handicaps, classify individuals with handicaps, and identify programmes for individuals with handicaps, including the services of the social welfare.	Lecture with discussion Field trip to motherless babies, prisons, handicap school	Assessment of planned programme for handicapped
International Health	1. Origins and development of international health 2. The World Health Organization 3. International health regulations 4. Other governmental and nongovermental organizations involved with international health	Students shall be able to recount a brief history of International Health Development; describe the organization, roles, and functions of the World Health Organization; describe the role, function, and structure of the UN specialized agencies; and describe the role and function of some bilateral organizations and international nongovern-mental organizations.	Didactic lecture Field trip to Port Health	Continuous assessment comprising an MCQ and essay
Integrated PHC	One month of rural posting for rural PHC experience	To expose the students to a rural community (where the majority of Nigerians live) so they appreciate the health challenges of the majority of the populace and participate in the delivery of health care services at the primary level.	Rural PHC experience on provision of PHC services to a defined community	Assessment of community health inter-ventions developed
Research	Community-based research on a chosen topic	Collaborative research project to provide the means of utilizing the knowledge on biostatistics and epidemiology.	Supervision of proposal development Data collection, analysis, and reporting	Assessment of the research report

TABLE 21.NATIONAL TEMPLATE DESIRED COMPETENCIES FOR COMMUNITY MEDICINE AND PHC FOR MBBS

Learning Objectives	Outcome Indices	Must Know/ Must Know to Pass 50% Contact Teaching Time	Should Know/ Should Know to Pass 30% Contact Teaching Time	May Know/ May Know to Pass 10% Contact Teaching Time
To produce graduates with adequate knowledge of and skills in epidemiology and control of communicable and non-communicable diseases. To produce graduates proficient in study design and data collection, analysis, and interpretation.	Demonstrate knowledge and skills in use of epidemiologic tools and their applications to disease prevention and control. Demonstrate skills on study designs and their execution, application of appropriate statistical tests, and interpretation.	Interaction between agent, host, and environment in the causation and propagation of communicable disease Principles of control of communicable and non-communicable diseases Types of epidemiologic study design Probability sampling methods Common inferential statistics and their interpretation	Epidemiology and control of all the major endemic communicable and non-communicable diseases in Nigeria Designing a questionnaire Review of relevant literature	Epidemiology and control of communicable and non-communicable diseases that are not endemic in Nigeria Advanced inferential statistics and their applications
To produce graduates capable of identifying and dealing with reproductive and family health problems. To produce graduates capable of identifying and assisting individuals with disabilities and persons affected by disasters in the community.	Demonstrate knowledge and skills in strategies required to improve reproductive and family health status. Demonstrate skills in identifying individuals with disabilities in the community and instituting appropriate methods of rehabilitation.	Concept, components, and objectives of family health Factors that influence family health status Common causes of morbidity and mortality among women and children Classification and causes of handicaps Underprivileged members of society Provisions and programmes for the care of under-privileged and handicapped members of society	Objectives and components of maternal and child health services Integration of maternal and child health and family planning programme Organization and evaluation of family health services Comparison of social welfare services in Nigeria and other countries Disaster relief	Recent advances in reproductive and family health Advanced care options for specific disabilities
To produce graduates with adequate knowledge of interaction between work and health with a view to recognizing, managing, and controlling common	Demonstrate skills in recognizing common work-related health problems and instituting appropriate control. Demonstrable skills in identifying influence of	The environment of working places and related hazards Common occupational health problems in Nigeria and their control Main components of man's total environment and their intervention with man Environmental and other factors that influence	Simple diagnostic methods for common work-related health problems Organization of occupational health services Current environmental issues (e.g., air pollution, water pollution, and soil	National and international regulations relating to occupational health Contributions of disciplines other than medicine to the maintenance of health and control of disease

Learning Objectives	Outcome Indices	Must Know/ Must Know to Pass 50% Contact Teaching Time	Should Know/ Should Know to Pass 30% Contact Teaching Time	May Know/ May Know to Pass 10% Contact Teaching Time
work-related health problems. To produce graduates proficient in recognizing the interaction between man and his environment and interaction between components of man's environment in relationship to their impact on human and ecosystem health.	environment and other factors on human behaviour and ecosystem health. Demonstrate skills on how human behaviour affects health and disease of individuals, families, and communities.	human behaviour How human behaviour affects health and disease	pollution) and their significance to health	
To equip graduates with knowledge and skills in the health promotion and educational strategies required to engage individuals, families, groups, and communities for the purpose of improving health-related behaviour. To produce graduates with the requisite knowledge and skills required for providing of CAM medicine in clinical practice.	Demonstrate skills in designing and conducting health promotion and educational activities for individuals, families, groups, and communities. Demonstrate knowledge and skills in the use of CAM for common health problems.	Use of basic principles of communication during consultations with patients Identify behaviours that led to a patients' illness and the antecedent factors associated with the behaviours Counselling to patients Available CAM in clinical practice Use of CAM for common health problems	Processes of observation, interviewing, and reviewing documents required for community diagnosis Design and conduct simple health education programmes. Socio-cultural factors that may influence use of CAM for common health problems Efficacy and limitations of CAM	Conduct training programmes for primary and other allied workers in the health field Adverse effects of CAM
To produce graduates with the requisite knowledge and skills required for effective and efficient management of health care services at all levels in both public and	Demonstrate knowledge and skills for effective and efficient management of health care resources and services in both public and private sectors.	Concepts, principles, and functions of management Organization and management of health services in Nigeria Management of human, material and financial resources	Economics of health care Health Planning Process Evaluation of health services	

Learning Objectives	Outcome Indices	Must Know/ Must Know to Pass 50% Contact Teaching Time	Should Know/ Should Know to Pass 30% Contact Teaching Time	May Know/ May Know to Pass 10% Contact Teaching Time
private sectors.				
To produce graduates with the requisite knowledge and skills required for designing solutions to environmental health problems of populations and communities. To produce graduates with demonstrable knowledge and skills of demography and health statistics and their application to the study of health of human populations.	Demonstrate skills in environmental health applications in improving community health. Demonstrate skills in control of environmental hazards in the community. Relate demographic statistics to the health status of the population to influence intervention.	Components of environmental health and their associated health problems Design solutions to address environmental health problems Current challenges of environmental health management Sources of population data, health, and vital statistics Measurement of health and disease Interaction between medical action, population and health.	Public health department Public health laboratories Public health laws Measurement of fertility and mortality Standardization of vital rates Population dynamics, structure, and growth	Advanced solutions for specific environmental health challenges Specific morbidity and mortality rates

TABLE 22. NATIONAL TEMPLATE ASSESSMENT METHODS FOR COMMUNITY MEDICINE AND PHC FOR MEDICINE

Semester/Type	Posting
200 L (2nd Semester)	**Integrated Basic Science**
Formative assessment	SAQs
Summative assessment	SAQs
300 L (1st Semester)	**Integrated Clinical Application of Basic Science**
Formative assessment	SAQs
Summative assessment	MCQs, SAQs
400 L (1st and 2nd Semesters)	**Preventive and Social Medicine/COM I**
Formative assessment	SAQs
Summative assessment	MCQs, picture test, report writing
500 L (1st and 2nd Semesters)	**Preventive and Social Medicine/COM II**
Formative assessment	Report writing
Summative assessment	SAQs, graded research project, graded presentation
600 L (1st and 2nd Semester)	**Preventive and Social Medicine/COM III**
Formative assessment	SAQs
Summative assessment	MCQs, SAQs, *viva voce*, picture tests

3.13.4 CONCLUSION AND SUMMARY OF CHANGES

1. Name of the department – "Community Medicine and PHC" – suggested. Individual schools are free to adopt whatever name is acceptable to their institutions, provided the principles and spirit of this curriculum are maintained.
2. Exposure to community should be from the beginning of medical school. PHC should also be started at the beginning of the 200 level, integrated with other courses.
3. Assessment of learning should commence at the first professional examinations. "What is not assessed is never learned!"
4. Newer methods of assessment that have higher psychometric properties should be adopted.
5. Additional new topics – professionalism, communication, interpersonal skills, ethics, health management, global health, and computer skills (Information technology) – with time judiciously used by students and staff, allotted to the programme.
6. Research methodology, research projects, and supervision should be strengthened.

3.14 NATIONAL CURRICULUM TEMPLATE FOR PROFESSIONALISM AND HEALTH ETHICS

3.14.1 INTRODUCTION

There is widespread concern today among conscientious physicians, medical educators, and the general public that the practice of medicine is becoming increasingly unprofessional and that the profession is losing its commitment to protect the welfare of patients.

The word "profession" is derived from the Latin word "professio," meaning a public declaration with the force of a promise. Professions do, therefore, declare publicly that their members promise to act or behave in certain ways and that the group and society may discipline those who fail to do so. Professions, therefore, normally issue a code of ethics stating clearly the standards by which its members can be judged.

The hallmarks of professions are:

i. Competence in knowledge and skills.

ii. Acknowledgement of specific duties and responsibilities towards the individuals and society they serve, even at some cost to themselves.

iii. The right to train, admit, discipline, and dismiss members for failure to sustain competence or observe duties and responsibilities.

The American Board of Internal medicine describes professionalism as constituting those attitudes and behaviours that serve to maintain patient interest above physician self-interest. To emphasis the core professionalism, Sir William Osler (1903) said, "The practice of Medicine is not a business and can never be one …. Our fellow creatures cannot be dealt with as a man deals in corn and coal; the human heart by which we live must control our professional relations."

MDCN and NMA are statutorily and morally under obligation, respectively, to ensure and enforce professionalism among all members of the medical and dental professions through proper education, evaluation, and sanctions, where necessary.

3.14.2 PRESENT STATUS IN NIGERIAN MEDICAL AND DENTAL SCHOOLS

Presently, professionalism is not a *core competence* course in Nigerian medical schools. So far it has so assumed that students would acquire the principles, obligations, and commitments associated with professionalism in the course of training. Recent actions and behaviours of medical practitioners have made it imperative for professionalism to be included as a core competence in the curricula of medical and dental colleges and to be formatively and summatively assessed. This curriculum is therefore designed to serve as a template for medical and dental training institutions.

3.14.3 OBJECTIVES OF THE CURRICULUM

At the end of the training the medical and dental graduate will be able to:

3.1.4.3.1 Demonstrate Compassion and Empathy.

3.1.4.3.2 Interact with patients and others without discriminating on the basis of religion, ethnicity, gender, or educational or socioeconomic status.

3.1.4.3.3 Demonstrate positive work habits, including punctuality, integrity, accountability, dependability, and professional appearance.

3.1.4.3.4 Demonstrate altruism through responsiveness to the needs of patients and society that supersedes self-interest.

3.1.4.3.5 Demonstrate principles of confidentiality with all information transmitted both during and outside of a patient encounter.

3.1.4.3.6 Demonstrate knowledge of regulatory issues pertaining to the practices of the medical and dental professions, including biomedical research, code of conduct, health ethics, the MDCN Regulatory Act, and relevant state laws.

3.1.4.3.7 Demonstrate commitment to excellence and ongoing professional capacity development, including postgraduate studies.

3.1.4.3.8 Demonstrate respect and interpersonal skills in functioning as a leader and member of a multidisciplinary health care team

3.14.4 RATIONALE

The goal of this part of the curriculum is to produce medical and dental graduates who will be holistically professional in their practice and have commitment to excellence, respect, integrity, empathy, accountability, and altruism, not only to their patients, but also to the general public. To this end, students will be instructed and assessed in this discipline throughout their course (starting at the 200 level) with increasing emphasis in the clinical years.

3.14.5 EXPECTED OUTCOMES, LEARNING EXPERIENCE, AND ASSESSMENT

The expected outcomes, learning experience and assessment are as summarized in Table 23.

TABLE 23.NATIONAL TEMPLATE LEARNING OBJECTIVES FOR PROFESSIONALISM AND ETHICS

Objectives	Expected Outcomes	Learning Experience	Assessment Methods
Demonstrate compassion and empathy: be understanding and respectful to patients, their families, other physicians, and staff.	Treat patients and their relations and colleagues and other staff with due respect and recognition. Appreciate patients' desire to get well and tolerate patients' and relations' low level of understanding of diseases. Recognize the rights of patients and relations to withhold consent on treatment, seek to discontinue treatment, or be discharged against medical advice.	Organized lectures. Demonstration to students during clinic and ward rounds. Workshop or seminars for students, which shall involve practitioners in private practice to share experiences. Educators shall serve as role models.	Observation of students during clinic and ward rounds. Other staff may also comment on their observations of students. Students may be assessed by senior registrars, senior nursing staff, and consultants. Scores are to be awarded on a scale of 1-10 in a logbook.
Interact with patients and others without discriminating on the basis of religion, ethnicity, gender, educational, or socioeconomic status.	Treat patients without discrimination regardless of religion, beliefs, socioeconomic status, gender, and culture. Recognize the impact of religion and culture on health and disease and respect such cultures and religions.	-do-	Students should be observed against conduct or actions that show preference or disdain for religion, ethnicity, gender, or socioeconomic status of patients, relations, or staff. Scores are to be awarded on a scale of 1-10 in a logbook.
Demonstrate positive work habits, including punctuality, dependability, and professional appearance.	The doctor must be at work at the right time. The doctor must be honest, reliable and trustworthy. The doctor's dress at all times must inspire confidence in the patient, relations, and friends.	Organized seminar. Trainers must also demonstrate these attributes in their daily interaction with learners. The appearance of trainers and their subtle discouragement of unprofessional dress will be enough to send across the message.	By daily observation and remedial or approval comments, as necessary, documented in a logbook. Appearance at examinations should be scored.
Demonstrate responsiveness to the needs of patients and society that supersedes self-interest.	A doctor who responds quickly to all matters pertaining to patient care. When his life is not threatened, the doctor should sacrifice personal comfort or convenience for his patient.	The attitude of trainers to work will go a long way in inculcating this professional habit into the trainees. The degree or general level of intolerance to truancy	Monitor trainees' levels of participation in class, ward, and clinic activities. Timeliness and correctness in

Objectives	Expected Outcomes	Learning Experience	Assessment Methods
	The doctor should see himself always as the servant of the society.	and selfish attitudes within the team will determine how much the trainees take in. Give responsibilities, such as attachment to call teams.	accomplishing assigned clinic and ward activities should be noted and scored accordingly. Participation in evening ward rounds with the house officer, registrars, and consultants should also be noted and scored.
Demonstrate principles of confidentiality with all information transmitted both during and outside of a patient encounter.	No information received from a patient in the course of care should be shared or divulged to anyone except for the good or further care of the patient, even after a patient has died (unless compelled by a court with appropriate jurisdiction).	Lecture series on confidentiality and implications to the patient, family, society and the profession.	By examination. In addition, any confirmed report of release of patient information will be severely reprimanded.
Demonstrate knowledge of regulatory issues pertaining to the practice of the profession, including biomedical research (code of conduct, ethics, MDCN regulatory Act, and relevant state laws).	The trainee must know when to seek for informed consent and how to go about it. The trainee must know the ethics, etiquettes, and codes of conduct expected of a doctor. The trainee must be conversant with all regulatory provisions governing the practice of medicine, including registrations, licensing, and renewal, and state laws that apply to medical practice. Appreciate the need to practice the profession within the bounds of the laws of the land.	To be delivered through a series of lectures.	By examination.
Demonstrate a commitment to excellence and ongoing professional development, including postgraduate studies.	The trainee must fully appreciate the dynamic nature of medicine and the need to keep abreast of developments within the discipline through continuing professional development. The trainee must also appreciate that he/she can do much more for him/herself, the patient, and society through further education.	Trainees will appreciate the dynamics of medicine through reference to past practices, where necessary, and history of medical development (both formal and informal). Introduce trainees to medical journals and encourage them to search out for new information at every stage of the clinical programme. Journal club meetings with senior residents may be necessary.	Participation in journal club activities to be monitored and records kept. Students should be given assignment to try to find solutions or suggest ways of overcoming challenges in the learning environment or community. They should also be made to do some literature review on given topics. These

Objectives	Expected Outcomes	Learning Experience	Assessment Methods
			should be scored.
Demonstrate acquisition of effective communication skills.	The doctor must have the ability to effectively pass the correct information to patients and support staff and patients relations. He/she should make use of effective body language in communication, should be a good listener, and should give correct feedback. Must chose appropriate words in communication, taking into consideration the impact such words could have on the listeners. Be able to write a good case history, referral letters, reports, essays, and other form of communication in practice. He should be able to obtain informed consent, effectively convey adverse events (such as death to a patient's relations). He/she should be able to make presentations using slide and other IT tools.	Series of lectures, with appropriate demonstrations, will be given by communication experts to impart communication skills. Method and approach for obtaining informed consent and relaying sad news to patients and relations will be demonstrated. Lectures will be given on case history, referral, and report writing. Trainees will be made to give slide presentations on chosen or given topics and to present cases during ward rounds or at other suitable forums.	Knowledge of communication types and skills will be assessed through written examinations, formative assessment of case histories, and other reports and essays. Presentations will also be formatively assessed. Case presentations at examinations will be scored.
Demonstrate a commitment to the NMA and always serve as its ambassador.	Trainees to know about the structure of the NMA, its objectives and relevant sections of the constitution. Trainees will know their roles as members of the NMA and how the NMA will be of use to them as practitioners. They will also know their obligations to the NMA, particularly in the areas of protection and financial support. Understand the role of the NMA in promoting quality health care and advocacy for equal access to quality care for all citizens.	Officials and senior members of the association shall periodically visit the students under the aegis of the college and have interactions with them on the workings, missions, and visions of the NMA, and the obligations and responsibilities of members to the association. This shall be done two to three times per session in form of a dinner.	Clinical students shall attend the state and national annual general meeting of NMA, where applicable. They should have free access to NMA newsletters and journals.
Demonstrate respect and interpersonal skills in functioning as a leader and member of a multidisciplinary health care team.	Be able to relate to patients and relations, as well as to staff, including seniors and peers, with respect. Be able to appreciate the feelings or views of others, even if such border on ignorance. Be able to acquire, exhibit, and provide necessary leadership as a team leader.	Attitudes and behaviours of trainers shall serve as models for students. Lectures shall be given on leadership skills and teamwork.	By observation and appropriate documentation in a logbook. By examination.

3.14.6 ASSESSMENT

This shall be in three forms:

- Direct observation of students and awarding scores
- Formative assessment of assignments (periodically)
- Formal Examination

The final assessment (examination) shall cover the following areas (among others):

i. Clinical and/or medical administrative competence
ii. Communication skills
iii. Ethics
iv. Adherence to societal and legal duties
v. Knowledge of relevant laws
vi. Commitment to excellence, integrity, empathy, respect, accountability, and altruism

3.15 NATIONAL CURRICULUM TEMPLATE FOR UNDERGRADUATE PROGRAMME IN DENTISTRY (BDS)

3.15.1 INTRODUCTION

Dental education in Nigeria started in 1967 with the establishment of the division of dentistry in the then Lagos Medical School (now the College of Medicine, University of Lagos). This was the first school to train an indigenous dental work force in Africa south of the Sahara desert. The universities of Benin, Ibadan, and Ife established their dental schools around 1975, but since then no other dental school had been granted accreditation until recently, when the universities of Maiduguri, Nigeria (Enugu campus), and Port-Harcourt commenced training. The BDS curriculum has remained largely unchanged for about 45 years.

The focus of dental education has changed tremendously over the years due to technological advances that have improved methods of teaching, learning, diagnosis, and treatment. Dentists now form part of a multidisciplinary health care team in which they are supposed to provide leadership. With the increasing demands on dentists in hospital and community health teams, there is a need to possess skills and information related to current dental practice. The dental health needs of society are changing, and a new BDS curriculum should be able to address this. To be relevant, dental students should be able to adjust to current requirements in their environment, become proficient in new techniques in clinical practice, and be able to translate the results of findings of research into clinical practice. Therefore there is a need to modify the dental curriculum.

3.15.2 GOAL OF THE CURRICULUM

The goal of this part of the curriculum is to produce dental graduates who will be proficient, independent, humane, research-focused, problem-solving, and business-oriented practitioners, able to cope with the challenges of the community, and who will possess international standards in skills critical to oral health care.

3.15.3 OBJECTIVES OF THE REVISED DENTAL CURRICULUM

The objectives of the revised dental curriculum are:

3.1.5.3.1 To produce graduates who will be competent, confident, compassionate, problem-solving, research-oriented, and entrepreneurial dentists, able to respond to the oral health needs of their community, now and in the future.

3.1.5.3.2 To produce oral physicians, rather than oral surgeons, whose leaning will be more towards disease prevention than treatment.

3.1.5.3.3 To enhance educational and professional collaboration between dentistry and other health professions, featuring more emphasis on the interaction of dental and medical problems.

3.1.5.3.4 To revitalize the science underlying clinical decision-making via evidence-based approaches, making assessment and learning competency-based.

3.1.5.3.5 To produce world-class graduates whose competences enable them to function at the highest levels of academic, hospital, or community settings, not only in Nigeria but also worldwide.

3.1.5.3.6 To engender self-directed learning in dental students and thus prepare them for the life-long learning that is essential for keeping up with the constant changes in dental practice.

Tables 24-26 are to guide the experiential learning, desired competencies, and assessment methods in dentistry.

TABLE 24.NATIONAL TEMPLATE OF LEARNING OBJECTIVES FOR DENTISTRY

Learning Objectives	Expected Outcomes	Learning Experience	Assessment Methods
Demonstrate competences to enable them to function at the highest levels of academic, hospital, or community settings, not only in Nigeria but also worldwide.	Show broad academic and professional competence in all areas of dentistry. Able to function as a general practitioner with competence in all procedures, comparable to local and foreign trainees and graduates at similar levels of training all over the world.	Didactic lectures Chair-side teaching Ward rounds Small-group teaching Seminars and workshops Tutorials	Formative and Summative examinations in the form of MCQs, SAQs, OSCE, practical and clinical examinations, and *viva voce*.
Possess the competence, confidence, compassion, problem-solving skills, research-orientation, and entrepreneurship to respond to the oral health needs of their community, now and in the future.	Be competent in a wide range of skills, including investigative, analytical, problem-solving, planning, communication, and presentation. Demonstrating a contemporary knowledge and understanding of the broader issues of oral health care. Show competence and confidence interacting with patients and their relatives. Manage patients and their relations with due respect, empathy,	Didactic lectures Showing examples to students during clinic and ward rounds. Workshops or seminars for students, which shall involve private dental practitioners sharing experiences. Teachers and educators shall serve as role models.	Logbooks, which will be used to score students, based on the observation of students during clinic and ward rounds. Assessment of students' conduct and behaviour by senior registrars and consultants.

Learning Objectives	Expected Outcomes	Learning Experience	Assessment Methods
	and recognition. Able to obtain informed consent and to adequately communicate adverse occurrences (such as death) to patients' relations. Develop and manage a general dental practice or clinic effectively, being an effective team leader and employer with very good communicative skills.		
Produce oral physicians rather, than oral surgeons, whose leaning will be more towards disease prevention than treatment.	The student must be community oriented and see the community as his "patient," rather than individual patient in the typical clinical set up. He/she must be able to apply the broad perspective of dental public health concepts in the prevention of oral diseases. The student must be able to treat patients without discrimination, regardless of gender, status, age, religion, beliefs, and culture. He/she should understand the effect of religion and culture on health and disease.	Didactic Lectures Field trips Workshops and seminars Showing examples to students during community visits and town/village meetings. Teachers and educators shall serve as role models.	Grading logbooks Grading during seminar presentation SAQs, *Viva voce* MCQs
Collaborate with other members of the health profession on educational and professional grounds, with emphasis on the interaction of dental and medical problems.	The dentist must have the ability to effectively pass correct information to other members of the health team on professional grounds. Be able to write a good case history, referral letters. And reports. Should be a good listener, chose the right words when communicating, and give appropriate feedback. He/she should be able to make presentations using slides and other IT tools.	Didactic lectures Seminars Case presentations Ward rounds	Written papers Grading during seminar and case presentations SAQs Viva voce MCQs
Revitalize the science underlying clinical decision-making via evidence-based approaches, making assessment and learning competency-based.	Show broad academic knowledge in the art and science of dentistry. Must understand the foundation of diseases of oral and dental tissues. Must understand that management of patients should be evidence-based, not speculative.	Didactic lectures Chair-side teaching Ward rounds Small–group teaching Seminars and workshops Tutorials	Formative and summative examinations in the form of MCQs, SAQs, OSCE, practical and clinical examinations, and *viva voce.*

Learning Objectives	Expected Outcomes	Learning Experience	Assessment Methods
Engender self-directed learning and thus prepare for the life-long learning essential for keeping up with the constant changes in dental practice.	The student must fully understand the continuous changes in the practice of dentistry and must be able to keep up with new developments in the discipline through on-going self-directed learning. The student must also understand the importance of life-long learning for him/herself, for the patient, and for society as a whole. The student should appreciate continuing professional development as a support for the concept of life-long learning.	Didactic lectures Introduce the students to scientific journals to stimulate their interest to look for new information at every level of the dental programme. Seminars and tutorials with resident doctors may be necessary.	Involvement in seminars and tutorials, to be monitored with records kept and marks allocated. Seminar presentations on ways of overcoming problems of learning. Short term paper on literature review on given topics, which should be scored.

TABLE 25. NATIONAL TEMPLATE DESIRED COMPETENCES FOR CLINICAL DENTISTRY

Learning Objectives	Outcome Indices	Must Know/ Must Know to Pass 50% Contact Teaching Time	Should Know/ Should Know to Pass 30% Contact Teaching Time	May Know/May Know to Pass 10% Contact Teaching Time
To produce dental graduates who are competent to diagnose dental and oro-facial diseases.	Demonstration of the art and science of history-taking, physical examination, formulating diagnoses, investigating and recordkeeping, and the ability to draw up a treatment plan.	The clinical features of common oral and maxillofacial diseases Synthesize disease features into clinical diagnoses and refine the differential diagnoses into definitive diagnosis	How to interpret the results of common investigations	How to diagnose clinically uncommon oral and maxillofacial diseases, including syndromes Minimally invasive surgery

Learning Objectives	Outcome Indices	Must Know/ Must Know to Pass 50% Contact Teaching Time	Should Know/ Should Know to Pass 30% Contact Teaching Time	May Know/May Know to Pass 10% Contact Teaching Time
To produce dental graduates who are competent to manage patients as members of his/her socioeconomic milieu and attend to them in a socially responsive manner	Possession of adequate skills in counselling on simple preventive measures for common oral diseases.	Socioeconomic environment of the country and relate it to the aetiology and management of diseases	Health care financing	Social intervention National Health and Policy Insurance
To produce dental graduates who are able to interpret radiographs and histology of common dental and oro-facial diseases.	Knowledge of basic radiological and histological criteria.	Presentation, types, and techniques of dental radiography Processing errors	Dental X-ray machine Types of X-rays Film storage	Extra oral radiography
To produce dental students with adequate knowledge of the use of dental materials to manage common restorative dental conditions.	Knowledge of basic dental materials use and demonstration of competence in management of restorative dental conditions.	Principles of preparation of different restorative materials Primary and secondary impressions in partial and complete denture construction Principles of tooth preparation for different re-storative materials Classification of dental trauma Tooth discoloration	Failure of different restorations and replacement with appropriate materials Clinical approach to endodontics Steps involved in providing simple adhesive and functional inlays, crowns, and bridges	Endodontic camera or microscope Implant-retained prosthesis Complex/advanced restorations requiring occlusal scheme
To produce dental graduates who are well equipped to effectively manage oral and maxillofacial surgical emergencies.	Knowledge of basic oral and maxillofacial surgical principles.	Able to diagnose oral and maxillofacial surgical emergencies and institute lifesaving first aid and basic life support	Investigation of patients presenting with oral and maxillofacial surgical emergencies Interpretation of common investigations Institute con-tinuing care	The definitive management of oral and maxillofacial surgical emergencies
To produce dental graduates who are familiar with dental public health principles and concepts and possess general	Ability to define dental public health in a broad perspective and apply the concept in the prevention of oral diseases. Ability	Community diagnosis Proffer solutions to oral health problems Carry out oral research Introduction to	Community oral health programmes Types of organizational structure Dental team and	Process of behavioural change Dental health languages

Learning Objectives	Outcome Indices	Must Know/ Must Know to Pass 50% Contact Teaching Time	Should Know/ Should Know to Pass 30% Contact Teaching Time	May Know/May Know to Pass 10% Contact Teaching Time
knowledge of research in dentistry.	to conduct simple dental research and analysis.	research methodology	auxiliaries Infection control measures Basic data analysis methods	
To produce dental graduates who possess sound ethical behaviour and are skilled in verbal and nonverbal communication.	Demonstration of sound ethical behaviour and communication that ensures effective and efficient clinical practice.	Ethics of scientific research and basic computer skills in getting knowledge online Basic communi-cation skills	Unethical practices that should be avoided	

TABLE 26. NATIONAL TEMPLATE ASSESSMENT METHODS IN CLINICAL SCIENCES FOR DENTISTRY

Semester/Type	Posting
300 L (1st Semester)	**Integrated Applied Basic Science**
Formative assessment	MCQ, core/integrated SAQ
Summative assessment	MCQ, SAQ
300 L (2nd Semester)	**Integrated Clinical Posting I**
Formative assessment	Portfolio, OSPE, picture test, SAQ, viva voce
Summative assessment	Portfolio, OSPE, MCQ
400 L (1st and 2nd Semesters)	**Medicine II/Core Lectures**
Formative assessment	Core/integrated, OSCE/SAQs portfolio, viva voce
Summative assessment	OSCE, MCQ, logbook, long case, SAQs
600 L (2nd Semester)	**Revision Clinical Postings**
Formative assessment	Portfolio, long case/short case, viva voce, picture test, OSPE
Summative assessment	Portfolio, MCQ, long essays/short essays, viva voce, picture test, OSCE, term paper

3.16 NATIONAL CURRICULUM TEMPLATE FOR INTEGRATION OF BASIC, LABORATORY MEDICAL, AND CLINICAL SCIENCES IN MEDICINE AND DENTISTRY

3.16.1 INTRODUCTION

Traditionally, medical and dental curricula involved the segmentation of teaching and learning into discrete portions that are often not related to each other. Integration is an attempt to change this and make the basic and social medical sciences more relevant to clinical practice. This provides students with better learning opportunities, leading to deeply rooted knowledge that can be recalled, applied, and updated more easily.

The integrated curriculum structure has only been around since about the 1980s. Early patient contact is integral to making a "new" doctor in this curriculum. The focus is on earlier introduction to clinical sciences, and the information may be taught by either breaking it up into body systems (system-based) or by the use of cases (case-based). Users of the integrated structure believe it is easier to learn all about a body system before moving on to the next one, breaking information up into "categories." An integrated curriculum aims to bring students *beyond mere fact* and *concept* acquisition to a level of *scientific fluency* using a common language of medical science, with which they can begin to think creatively about medical problems.

Horizontal integration is integration of the medical and dental school curriculum across courses in the basic and applied basic (laboratory medicine) clinical science disciplines at the same level of instruction. Horizontal integration refers to identifying concepts, or skills, that cut across the disciplines, and then using these as an integrated focus for course materials. Horizontal integration is commonly done around system-based integration, using the organ systems at different levels in different basic or clinical science courses. For example, "Structure confers function, and abnormal structure leads to abnormal function, abnormal development." Disease competencies teaching modules are to be used in an integrated curriculum, as opposed to case-based integration.

Vertical integration involves integration of the medical and dental school curriculum across all years in medical school. True vertical integration refers to interweaving clinical skills and knowledge into the basic science years and, in turn, reinforcing and continuing to teach basic science concepts as they apply during the clinical years.

3.16.2 RATIONALE FOR SELECTION

An integrated, system-based, undergraduate medical and dental curriculum has been recommended for the Template curriculum, as opposed to case-based integration.

Curriculum integration has become an important concept in medical education, as it provides a framework for students for applying knowledge from several disciplines and for using this knowledge to solve real-life problems. In the process, students begin to develop critical-thinking and problem-solving capabilities that they will carry with them into their professional careers. Curriculum integration can be challenging when applied to biomedical and clinical sciences, however appropriately modified courses can help students integrate ideas and concepts gained in earlier courses to meet specific medical care outcomes defined by their institutions. In the face of this curricular dilemma, schools and colleges of medicine must encourage faculty in the different disciplines to coordinate their teaching efforts and/or

develop interdisciplinary courses and experiences to optimize the knowledge students will gain. Accordingly, many colleges of medicine are currently increasing their emphasis on curriculum integration. A major benefit of integrating content across the curriculum is the opportunity to introduce and reinforce basic and clinical sciences while applying these concepts and principles to the actual practice of the profession. Content integration helps students see how the science and practice of medicine come together in a "big picture" of scientifically grounded, evidenced-based medical care and guides them to become critical thinkers and life-long learners. Further, when content is integrated across the curriculum, students can continuously focus on the importance of the clinical knowledge they are gaining and how it meets the needs of the society they will serve as health care professionals.

The system-based method of integration has been selected instead of case-based or problem-based approaches for the following reasons:

1. It is an easier approach to integrate, because units and process of integration are very definite.
2. It is thus easier to understand by faculty and staff.
3. It is a less-radical change from current instructional methods than other methods of integration.
4. Faculty development programmes are easier to organize and sustain.
5. The materials for instruction can be adapted from those currently available.
6. It is less resource intensive when compared with other of integration.

3.16.3 OBJECTIVES

The ultimate goal of curricular integration and interdisciplinary teaching is to create a learning environment in which future health care professionals learn to work together to improve health care delivery and to better understand the complex and comprehensive nature of disease and treatment. The objectives of integration of basic and clinical sciences therefore are to:

1. Encourage better understanding and application of basic and social sciences to the pathogenesis of disease and principles of management of clinical entities.
2. Encourage the understanding of biological principles and concepts that promote critical thinking in students and encourage them to examine new ideas and develop solutions to basic, clinical, and social science aspects of diseases.
3. Reduce the information overload that is prevalent in traditional curricula as a result of independent teaching of various disciplines.
4. Make available time for the addition of, and emphasis on, topics such as communication skills, health management, ethics, professionalism, and computer skills.
5. Produce medical and dental graduates who are able to integrate basic, clinical, and social medical sciences and ensure better understanding and practice of clinical medicine and dentistry.
6. Encourage deep learning of all aspects of medicine and dentistry, which further promotes self-directed learning, a key attribute required of all good physicians and dentists.

3.16.4 METHODOLOGY FOR IMPLEMENTATION OF INTEGRATED CURRICULA

Medical and dental schools can promote curricular integration as structured interdisciplinary experiences for students. This has become an important strategy in health care education and practice and involves bringing faculty members from different disciplines together to teach, either in blocks or as

a truly integrated team. While good in theory, it can be difficult to sustain in practice, even when faculty are committed to the block-teaching concept, due to difficulty in coordinating multiple schedules and the need for regular communication between faculty, who may not routinely interact. Another possible approach to content integration is to encourage faculty members to incorporate information from other disciplines into their own courses and appropriately reward those whose efforts to help students utilize acquired knowledge in a longitudinal manner are successful. This approach depends on individuals rather than entire faculty cohorts and may be a faster approach to interdisciplinary teaching and curricular integration than the block-teaching model. It is also a strategy that is achievable with technology and lends itself to web-based courses instructed by individuals.

It is advised that medical education units or departments be established to guide the integration process to ensure effective implementation of the curriculum. The unit or department should be staffed by medical education and content experts who will guide the negotiation between departments, as this requires them to give up traditional territories, and these processes can be heated. These experts will also be appointed as the "lead faculty" or "course directors" for the new integrated units. The medical education unit will also be charged with monitoring curriculum implementation and ensuring regular reviews and revisions of the curriculum.

3.16.5 TEMPLATES

As mentioned above, the overarching goal is to foster the integration of basic and clinical science, both horizontally (across disciplines) and vertically (across years) throughout the training period. This implies teaching the different aspects of either basic or clinical sciences simultaneously according to body systems. For example, teaching the anatomy, physiology, and biochemistry of the cardiovascular system at the same time, that is, basic medical sciences in horizontal integration. Vertical integration refers to the teaching of these basic sciences in conjunction with the clinical sciences.

A practical template for integration appears here:

i. **Integrated core basic medical sciences** – These include the disciplines of:

b) Anatomy

c) Biochemistry

d) Physiology

200 Level: Four two-month block postings at the 200 level (i.e., the first year of medical/dental school). These postings should involve teaching anatomy, biochemistry, and physiology concurrently in two monthly blocks throughout the first year of instruction.

300 Level: Clinical application of basic sciences. Here, the students will revisit what was learned in the previous year and learn to relate it to clinical practice. They will also attend some medical practice sessions in laboratory medicine, GOPD, and A&E (i.e., ambulatory services), and at accredited private hospitals and dental clinics as an orientation to clinical practice.

ii. **Integrated laboratory medical sciences (applied basic medical sciences)** – These are the pathology disciplines (haematology, histopathology, chemical pathology, medical microbiology) as well as pharmacology. Foundation courses in these specialties should be taken as a bridge between the core basic medical sciences and the clinical sciences. As they are generally applied to clinical sciences as well, they should run throughout the clinical years, too.

300 Level: Two integrated block postings in the 300 level, one in each semester, including the different aspects of the applied basic medical sciences.

300 Level: Clinical application of basic sciences. The applied basic medical sciences will also be integrated here, alongside basic medical and clinical sciences. This is more of vertical integration

500 Level: A block posting in the first semester of this penultimate year to serve as a review of the applied basic medical sciences, including their clinical application. This is necessary, as there is a tendency to forget the significance and content of this very important aspect of medicine by the end of the medical school curriculum.

Histopathology on its own can also be reviewed at the time forensic medicine is being taught.

iii. **Clinical sciences:** These include the system-based integration of dental and maxillofacial surgery, paediatrics, internal medicine, surgery, obstetrics and gynaecology, psychiatry, radiology, and surgical specialties (such as anaesthesia, otorhinolaryngology, and ophthalmology).

300 Level: Clinical application of basic medical sciences – first semester.

300 Level: Integrated clinical posting in the second semester. This should include the system-based integration of medicine and surgery at a basic introductory level. Integrated Clinical Sciences I.

400 Level: This should include the integration of medicine, obstetrics and gynaecology, paediatrics, surgery, radiology, and anaesthesia. Integrated Clinical Sciences II and III.

500 Level: Some aspects of Obstetrics and Gynaecology, Paediatrics, Community Health and Psychiatry can be integrated in this year. Integrated Clinical Sciences IV and V.

The suggested format of integration at each level of study is laid out in Table 27.

TABLE 27. NATIONAL TEMPLATE FOR INTEGRATION OF BASIC AND CLINICAL SCIENCES

	1st Semester	2nd Semester
200 Level	Integrated Core Basic Medical Sciences I and II	Integrated Core Basic Medical Sciences III and IV
300 Level	Clinical Application of Basic Medical Sciences Integrated Block Applied Basic Medical Sciences Posting I	Integrated Clinical Sciences Posting I Integrated Block Applied Basic Medical Sciences Posting II
400 Level	Integrated Clinical Sciences II	Integrated Clinical Sciences III
500 Level	Integrated Clinical Sciences IV Integrated Block Applied Basic Medical Sciences III	Integrated Clinical Sciences V
600 Level	Integrated Clinical Posting VI	Integrated Clinical Posting VII

3.16.6 BACKGROUND AND TEMPLATE FOR 300- AND 400-LEVEL CLINICAL INTEGRATION IN MEDICINE AND DENTISTRY

Although, trainee experience in the clinical setting is largely guided by the type of cases that present during the particular rotation, the didactic component (lectures, seminar, tutorials, etc.) of a given clinical rotation could be delivered in series of integrated, system-based modules by a MDT of basic and clinical science faculty. Such integrated, system-based didactics offer the advantage of orienting students

to the interconnectedness of the various specialties in clinical medicine. Integration will therefore ensure that the students have a 360-degree understanding of clinical entities. Clinical science modules should be structured to cover common disease conditions in all relevant systems, as listed here:

- CAM
- Cardiovascular system
- Family medicine/human nutrition
- Forensic medicine
- Gastrointestinal/hepatobiliary system
- Gerontology
- Mental health
- Molecular medicine and biotechnology
- Musculoskeletal system and integumen
- Neurosciences
- Oncology and palliative care
- Renal/genitourinary system
- Reproductive health
- Respiratory system
- Surgery subspecialties

3.16.7 CHALLENGES OF INTEGRATED CURRICULA

There are several potential barriers to curriculum integration, including instruction and coordination of biomedical sciences courses (e.g., anatomy, physiology, biochemistry, pathology, and microbiology) by faculty external to the sciences basic to medicine, lack of understanding and involvement of faculty from one scientific area in the professional activities of other scientific areas (e.g., research activities and practice activities), and funding difficulties in resource-constraint countries like Nigeria. To minimize or eliminate these potential barriers to curriculum integration, it is essential that biomedical, social, and clinical science faculty actively develop strategies for integrating course content and learning activities, and that the concept of faculty and curricular interdependence is advocated by administrators at the department and college levels.

Tables 28-29 are suggested templates for integrated lecture series in the 300-level second semester and 400 level, whilst Figure 2 show a graphical representation of the curriculum schedule.

TABLE 28. NATIONAL TEMPLATE 300-LEVEL FIRST SEMESTER INTEGRATED APPLIED BASIC SCIENCE LECTURES

	Lectures per Topic																	
System/Topic	**Anaesthesia**	**Chemical Pathology**	**Community Medicine**	**Dentistry/Maxillofacial Surgery**	**Haematology**	**Histopathology**	**Human Nutrition**	**Medicine**	**Microbiology, Parasitology, and Virology**	**Obstetrics and Gynaecology**	**Ophthalmology**	**Otorhinolaryngology**	**Paediatrics**	**Pharmacology and Therapeutics**	**Psychiatry**	**Radiology**	**Radiotherapy**	**Surgery**
Cardiovascular	1				1	1		2		1			1	1				2
Endocrine system		1			1	1		2		1			1	1				1
EYE						1					4							
Family medicine			4															
Gastrointestinal system		1			1	1	1	2	1	1			1	1				2
Hepatobiliary system		1			1	1	1	2	1				1	1				1
Integumen						1		2					1	1				1
Introduction to Basic Systemic Pathology and Pharmacology		4			4	4			6					4				
Musculoskeletal systems						1								1				2
Neural system						1		2	1				1	1	2			2
Otorhinolaryngology						1						6		1				

	Lectures per Topic																	
System/Topic	**Anaesthesia**	**Chemical Pathology**	**Community Medicine**	**Dentistry/Maxillofacial Surgery**	**Haematology**	**Histopathology**	**Human Nutrition**	**Medicine**	**Microbiology, Parasitology, and Virology**	**Obstetrics and Gynaecology**	**Ophthalmology**	**Otorhinolaryngology**	**Paediatrics**	**Pharmacology and Therapeutics**	**Psychiatry**	**Radiology**	**Radiotherapy**	**Surgery**
Renal/Urinary		1			1	1		2	1	1			1	1				1
Reproductive system						1			1	2			1	1				1
Respiratory system	1	1				1		2	1				1	1				2
Other			6	4			2								4	4	2	

TABLE 29. NATIONAL TEMPLATE SCHEDULE OF 400-LEVEL VERTICALLY INTEGRATED DIDACTIC LECTURES PER MODULE FOR MEDICAL AND DENTAL CURRICULA

	Lectures per Topic																			
	External Resource Persons	CBSs	Histopathology	Chemical Pathology	Haematology	Microbiology	Human Nutrition	Pharmacology	Medicine	Surgery	Paediatrics	Obstetrics and Gynaecology	Community Medicine	Psychiatry	Family Medicine	Anaesthesia	Ear, nose, and throat Surgery	Ophthalmology	Dentistry	Radiology	Radiotherapy
CAM	4	-	-	-	-	-	1	1	-	-	-	-	1	-	3	-	-	-	-	-	-
Cardiovascular	-	1	1	-	-	-	1	2	4	4	4	1	1	-	1	2	-	-	-	1	-
Elderly care medicine	1	1	-	-	-	-	1	1	2	1	-	1	3	4	4	1	1	1	1	-	-
Endocrinology	-	1	1	1	-	-	1	2	4	3	4	1	1	-	1	-	-	-	-	1	-
Family medicine and human nutrition	-	-	-	-	-	-	3	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Forensic medicine	3	-	3	-	-	-	-	-	1	-	1	1	-	3	1	-	-	-	-	-	-
GIT	-	1	2	-	-	-	2	2	4	5	4	1	1	-	1	-	-	-	-	2	-
Mental health	-	-	-	-	-	-	-	1	-	-	-	1	1	7	1	-	-	-	-	-	-
Molecular medicine	5	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Musculoskeletal	-	1	1	-	-	-	-	1	4	10	2	-	1	-	1	0	-	-	-	1	-
Neurosciences	-	1	1	-	-	-	-	2	4	5	3	-	-	1	-	-	-	1	-	1	0
Oncology	-	-	1	1	1	-	2	2	5	9	4	3	1	1	2	2	2	1	-	1	3
Renal/Genito-Urinary	-	1	1	-	-	-	1	1	4	7	4	3	1	-	1	-	-	-	-	2	0

	Lectures per Topic																			
	External Resource Persons	CBSs	Histopathology	Chemical Pathology	Haematology	Microbiology	Human Nutrition	Pharmacology	Medicine	Surgery	Paediatrics	Obstetrics and Gynaecology	Community Medicine	Psychiatry	Family Medicine	Anaesthesia	Ear, nose, and throat Surgery	Ophthalmology	Dentistry	Radiology	Radiotherapy
Reproductive	-	1	-	-	-	-	1	-	-	2	1	7	1	-	1	1	-	-	-	-	-
Respiratory	-	1	2	-	-	-	-	1	4	4	4	1	1	-	1	1	-	-	-	1	-
Surgical subspecialties	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	7	8	3	3	2
Trauma	5	1	2	-	2	1	1	2	2	10	2	2	1	1	2	2	2	1	1	1	-

Notes:
Numbers in the table refer to the suggested number of lectures from each discipline/resource.
The version of this table adopted by each medical school should be based on curricula of the disciplines and specialties available, especially in the clinical sciences.

FIGURE 2. GRAPIC REPRESENTATION OF THE 2012 NATIONAL TEMPLATE FOR INTEGRATED MEDICAL AND DENTAL CURRICULUM

<table>
<tr><th>Session</th><th colspan="5">POSTINGS AND EXAMINATIONS</th></tr>
<tr><td>200L</td><td colspan="5">Integrated (Horizontal) Basic Science
(Includes Introduction to Professionalism & Ethics and Multidisciplinary Health-Care Delivery)</td></tr>
<tr><td>300L</td><td colspan="2">Integrated Laboratory Medicine I,
Integrated (Vertical Clinical Application of Basic Sciences
Revision of Basic Sciences</td><td>MBBS /BDS Part I Exam</td><td colspan="2">Integrated (Horizontal) Introductory Medicine and Surgery
and
Integrated Laboratory Medicine II</td></tr>
<tr><td>400L</td><td colspan="5">Integrated (Modified Vertical) System-Based Lectures</td></tr>
<tr><td>500L</td><td>Clinical Postings (Rotations)
Block Posting Revision</td><td>MBBS /BDS Part II Exam</td><td colspan="2">Clinical Postings (Rotations)</td><td>MBBS /BDS Part III Exam</td></tr>
<tr><td>600L</td><td colspan="4">Clinical Postings (Rotations)</td><td>MBBS /BDS Part IV Exam</td></tr>
</table>

3.17 NATIONAL CURRICULUM TEMPLATE PROCEDURES TO BE DONE BY MBBS STUDENTS

Tables 30 and 31 outline the procedures MBBS and BDS students are expected to do during their training.

TABLE 30. NATIONAL TEMPLATE PROCEDURES TO BE DONE BY MBBS STUDENTS

Procedure to be Performed	Level of Competence			
	Independent G1	Supervised G2	Elective G3	Excluded G4
Physical Examination Skills				
Examine all systems	X			
Fundoscopy, visual fields, visual acuity	X			
Mini mental-state examination	X			
Rinne and Weber tests	X	X		
Examination of a lump	X			
Examination of an ulcer	X			
Examination of external abdominal hernias	X			
Digital rectal examination	X			
Interviewing Skills				
Patient-centred consultation	X			
Holistic bio-psycho-social assessment	X	X		
Cope with language barriers	X	X		
Sexual history and counselling		X	X	
Counsel – HIV test, TOP, sexual assault, termination of pregnancy	X	X		
Motivate behaviour change	X	X		
Consultation shared with PHC nurse	X	X		
Breaking bad news	X	X		
Assess and consult families and couples		X	X	
Conduct a family conference		X	X	
Counsel a dying patient		X	X	
Counsel a pregnant woman with intrauterine foetal death	X	X		
Administration Skills				
Use a problem-oriented medical record	X			
Write a prescription	X			
Complete a sick certificate	X			
Complete a death certificate	X			
Write appropriate referral letters	X	X		
Develop and use flowcharts for chronic care		X		
Side-Room Tests				
Measure finger-prick glucose	X			
Urine dipstick test	X			
Measure finger-prick haemoglobin	X			
Finger-prick (rapid) HIV test	X			
Urine pregnancy test	X			
Test stool for occult blood	X			

Procedure to be Performed	Level of Competence			
	Independent G1	Supervised G2	Elective G3	Excluded G4
Smear test for acid-fast bacilli		X	X	
Smear test for Trichomonas vaginalis	X	X		
General Skills				
Take a peripheral venous blood sample	X			
Insert a urinary catheter	X			
Set up intravenous infusion	X			
Take blood culture samples	X			
Insert a nasogastric tube	X			
Take a throat swab	X			
Administer injection – IV, IM, SC, intradermal	X			
Perform a lumbar puncture	X	X		
Collect a femoral vein blood sample	X			
Collect a radial artery blood sample		X		
Internal Medicine Skills				
Perform an electrocardiograph	X			
Demonstrate inhaler and spacer technique	X	X		
Perform peak expiratory flow rate	X			
Perform pleural paracentesis		X		
Perform abdominal paracentesis	X	X		
Perform lymph node aspiration biopsy		X	X	
Set up intraosseous infusion		X	X	
Perform skin biopsy – punch or elliptical		X	X	
Perform induced sputum collection		X		
Perform pleural biopsy				X
Perform bone marrow biopsy				X
Perform liver biopsy				X
Forensic Medicine Skills				
Document drunk driving and take blood samples	X	X	X	
Document sexual assault and take samples		X		
Document intimate-partner violence		X		
Mental Health Skills				
Risk assessment – suicide, harm to others		X		
Certify patient under Mental Health Care Act			X	
Follow up under Mental Health Care Act			X	
Identify psychopathologies through history-taking and mental state examination	X			
Manage an aggressive or agitated patient	X			
Demonstrate basic counselling skills	X			
Conduct specialized psychotherapeutic sessions (such as Cognitive Behavioural Therapy)			X	
Diagnose and manage psychiatric conditions secondary to general medical conditions (e.g., delirium) or in the puerperuim		X		

Procedure to be Performed	Level of Competence			
	Independent G1	Supervised G2	Elective G3	Excluded G4
Diagnose and manage drug and alcohol withdrawal states	X			
Assess for suicidal tendencies	X			
Manage suicidal patients		X		
Psychosocial interventions for dementia	X			
Conduct electroconvulsive therapy				X
Identify and offer psychosocial support for common childhood psychiatric conditions (such as ADHD and autism)		X		
Obstetric Skills				
Examine a pregnant woman	X			
Assess progress of labour using partogram	X	X		
Perform vaginal speculum examination	X			
Complete antenatal growth chart	X			
Assess foetal well-being in labour	X	X		
Assess foetal movement/well-being	X	X		
Perform normal vaginal delivery	X	X		
Perform cardiotocograph	X	X		
Perform and suture episiotomy	X	X		
Perform evacuation of the uterus		X		
Perform assisted delivery – forceps				X
Perform assisted delivery – vacuum		X	X	
Perform manual removal of placenta		X		
Perform vaginal breech delivery		X	X	
Insert catheter into uterus for haemostasis		X	X	
Perform caesarean section				X
Repair third-degree tear				X
Gynaecology Skills				
Perform Papanicolaou smear	X	X		
Perform dilation and curettage of uterus		X		
Insert intrauterine contraceptive device		X		
Drain Bartholin's abscess		X	X	
Perform endometrial biopsy/sampling			X	X
Perform tubal ligation			X	X
Perform cervical biopsy				X
Drain Bartholin's cyst				X
Insert and remove contraceptive sub dermal implant		X		
Paediatric Skills				
Assess growth and classify malnutrition	X			
Well newborn check	X			
Administer medication using aerosol/spacer	X	X		
Administer IM injection – child/neonate	X			
Perform Tine test and Mantoux test	X			
Obtain capillary blood sample - heel/finger	X			
Set up intravenous infusion – child	X			
Assess gestational age at birth	X			
Kangaroo mother care	X			

Procedure to be Performed	Level of Competence			
	Independent G1	Supervised G2	Elective G3	Excluded G4
Insert nasogastric tube		X		
Developmental assessment	X	X		
Insert stomach tube – neonate/child		X		
Venous blood sampling – peripheral/jugular		X		
Perform lumbar puncture – child	X	X		
Set up incubator correctly		X	X	
Set up intraosseous infusion		X		
Insert urinary catheter – child/neonate		X	X	
Set up phototherapy for jaundiced baby		X		
Suprapubic bladder puncture – child	X	X		
Resuscitate newborn	X	X		
Advanced CPR – child		X	X	
Perform lymph node aspiration biopsy – child		X		
Assess child abuse (sexual/non-sexual)		X		
Perform umbilical vein catheterization		X	X	
Insert inter-costal drain – child/neonate				X
Perform ventricular tap for hydrocephalus			X	X
Exchange blood transfusion		X		
Surgical Skills				
Incise and drain an abscess	X			
Perform needle aspiration biopsy of any area		X		
Fine needle aspiration biopsy of breast lump		X		
Perform proctoscopy	X			
Excise lumps/bumps (e.g., sebaceous cyst)		X		
Perform cryotherapy/cauterization		X		
Debride wounds or burns		X		
Incise and drain perianal haematoma		X		
Apply compression dressing to venous ulcer		X		
Perform appendectomy				X
Perform rigid sigmoidoscopy to 18 cm			X	X
Urology Skills				
Perform penile block		X	X	
Insert suprapubic catheter			X	
Perform circumcision			X	
Drain hydrocoele			X	
Do open suprapubic catheter insertion		X	X	
Perform suprapubic bladder aspiration	X			
Ophthalmology Skills				
Instil eye drops or apply eye ointment	X			
Eyelid eversion – remove foreign body	X	X		
Washout eye for chemical burns	X	X		
Suture an eyelid		X	X	
Incise and drain a Meibomian cyst		X	X	

Procedure to be Performed	Level of Competence			
	Independent G1	Supervised G2	Elective G3	Excluded G4
Otorhinolaryngology Skills				
Syringe and dry swab an ear	X			
Cauterize nose for epitaxis		X	X	
Pack nose, cauterize for epistaxis	X	X		
Remove foreign body from the nose	X	X	X	
Remove foreign body from the ear		X	X	
Suture pinna/ear lobe		X		
Orthopaedic Skills				
Apply cast – below knee, below elbow	X			
Reduce shoulder dislocation		X		
Apply finger and hand splints		X		
Reduce closed fracture – hand, forearm		X		
Set up traction (skeletal or skin)		X	X	
Aspirate and inject knee joint			X	
Anaesthetic Skills				
Obtain airway control using an oro-pharyngeal airway	X			
Monitor patient in recovery room	X	X		
Intubate patient and ventilate patient using mask and Ambu bag	X	X		
Monitor patient during anaesthetic	X	X		
Set airflows – McGill, circle, T-piece		X	X	
Check Boyle's machine		X		X
Use laryngeal mask for airway management		X		
Administer ketamine anaesthesia		X	X	
Sterilize equipment		X		
Insert central venous line			X	X
Reverse muscle relaxation			X	X
Perform intravenous induction		X	X	
Administer general anaesthetic			X	X
Perform inhalation induction		X	X	
Administer spinal anaesthetic		X	X	
Perform Bier's block				X
Administer local anaesthetic	X	X		
Emergency Medicine Skills				
Measure Glasgow Coma Scale	X			
Administer oxygen	X			
Administer local anaesthesia	X			
Suture lacerations	X			
Obtain pressure control of haemorrhage	X			
Primary survey	X			
Administer blood transfusion	X			
Calculate percent body burn injury	X			
Secondary survey	X			
Perform advanced CPR – adult	X			
Relieve choking	X			
Insert inter-costal chest drain		X		
Remove splinter or fish hook		X		

Procedure to be Performed	Level of Competence			
	Independent G1	Supervised G2	Elective G3	Excluded G4
Immobilize spine		X		
Perform a ring block	X	X		
Transport critically ill patient	X	X		
Drain subungual haematoma		X		
Administer rabies prophylaxis		X	X	
Relieve tension pneumothorax	X	X		
Perform gastric lavage		X		
Perform synchronized cardio version			X	
Perform venous cut down			X	
Reduce temporomandibular joint dislocation			X	
Set up external electrical cardiac pacing				X
Perform cricothyroidotomy		X	X	
Perform endotracheal intubation			X	
Treat acute asthma	X	X		
Offer first-line treatment for tetanus	X			
Treat hypoglycaemia	X			
Offer first-line care for hyperglycaemic emergencies	X			
Offer first-line care for acute stroke	X			
Offer first-line treatment for acute coronary syndromes	X			
Offer first-line treatment for status epilepticus	X			
Offer first-line treatment for haematemesis	X			
Offer first-line treatment for acute pulmonary oedema	X			
Radiological Skills				
Plain X-rays				
Read Plain X-rays of the skull, chest, abdomen, pelvis, and extremities	X			
Special/Contrast Studies				
Read contrast images	X	X		
Preparation of patients for special procedures including consent	X	X		
Do fluoroscopy				X
Ultrasound Scan (USS)				
Read abdominal and pelvic USS pictures		X		
Read trans-oesophageal USS		X	X	
Read trans-cranial USS		X	X	
Do abdominal and pelvis USS			X	X
Do trans-oesophageal USS				X
Do trans-cranial USS				X
Computerized Tomography (CT) Scan				
Read plain and contrast CT scans of the brain	X			
Read plain and contrast CT scans of the chest, abdomen, and pelvis		X		

Procedure to be Performed	Level of Competence			
	Independent G1	Supervised G2	Elective G3	Excluded G4
Magnetic Resonance Imaging (MRI)				
Read T1/T2-weighted MRI scans of the brain and spine	X	X		
Read T1/T2-weighted MRI scans of the chest, abdomen, and pelvis		X		
Interventional Radiology				
Do interventional radiology procedures				X
Read images post interventional radiology procedures		X		

TABLE 31. NATIONAL TEMPLATE PROCEDURES TO BE DONE BY BDS STUDENTS

Procedure to be Performed	Level of Competence			
	Independent G1	Supervised G2	Elective G3	Excluded G4
Physical Examination Skills				
Examine all systems	X	X		
Fundoscopy, visual fields, visual acuity	X	X		
Mini-mental state examination	X	X		
Rinne and Weber tests		X	X	
Examination of a lump	X			
Examination of an ulcer	X			
Examination of external abdominal hernias		X	X	
Digital rectal examination		X	X	
Interviewing Skills				
Patient-centred consultation	X			
Holistic bio-psycho-social assessment	X	X		
Cope with language barriers	X	X		
Sexual history and counselling		X	X	
Counsel – HIV test, TOP, sexual assault	X	X		
Motivate behaviour change	X	X		
Consultation shared with PHC nurse	X	X		
Breaking bad news	X	X		
Assess and consult families and couples		X	X	
Conduct a family conference		X	X	
Counsel a dying patient		X	X	
Counsel a pregnant woman with intrauterine foetal death			X	X
Administration Skills				
Use a problem-oriented medical record	X			
Write a prescription	X			
Complete a sick certificate	X			
Complete a death certificate	X			
Write appropriate referral letters	X	X		
Develop and use flowcharts for chronic care		X		

Procedure to be Performed	Level of Competence			
	Independent G1	Supervised G2	Elective G3	Excluded G4
Side-Room Tests				
Measure finger-prick glucose	X			
Urine dipstick test	X			
Measure finger-prick haemoglobin	X			
Finger-prick (rapid) HIV test	X			
Urine pregnancy test		X	X	
Test stool for occult blood	X			
Smear test for acid-fast bacilli		X	X	
Smear test for Trichomonas vaginalis		X	X	
General Skills				
Take a peripheral venous blood sample	X			
Insert a urinary catheter	X			
Set up intravenous infusion	X			
Take blood culture samples	X			
Insert a nasogastric tube	X			
Take a throat swab	X			
Administer injection – IV, IM, SC, intradermal	X			
Perform a lumbar puncture		X	X	
Collect a femoral vein blood sample	X			
Collect a radial artery blood sample		X	X	
Internal Medicine Skills				
Perform an electrocardiograph	X			
Demonstrate inhaler and spacer technique	X	X		
Perform peak expiratory flow rate	X			
Perform pleural paracentesis			X	
Perform abdominal paracentesis		X	X	
Perform lymph node aspiration biopsy			X	X
Set up intraosseous infusion			X	X
Perform skin biopsy – punch or elliptical			X	X
Perform induced sputum collection		X		
Perform pleural biopsy				X
Perform bone marrow biopsy				X
Perform liver biopsy				X
Forensic Medicine Skills				
Document drunk driving and take blood sample	X	X	X	
Document sexual assault and take samples		X		
Document intimate-partner violence		X		
Mental Health Skills				
Risk assessment – suicide, harm to others			X	
Certify patient under Mental Health Care Act			X	X
Follow up under Mental Health Care Act			X	X
Identify psychopathologies through history-taking and mental state examination	X			
Manage an aggressive or agitated patient	X			
Demonstrate basic counselling skills	X			
Conduct specialized psychotherapeutic sessions (such as cognitive behavioural therapy)			X	

Procedure to be Performed	Level of Competence			
	Independent G1	Supervised G2	Elective G3	Excluded G4
Diagnose and manage psychiatric conditions secondary to general medical conditions (e.g., delirium) or in the puerperuim		X		
Diagnose and manage drug and alcohol withdrawal states	X			
Assess for suicidal tenderness	X			
Manage suicidal patients		X		
Psychosocial interventions for dementia	X			
Conduct electroconvulsive therapy				X
Identify and offer psychosocial support for common childhood psychiatric conditions (such as ADHD and autism)		X		
Ophthalmology Skills				
Instil eye drops or apply ointment	X	X		
Eyelid eversion – remove foreign body		X	X	
Washout eye for chemical burns		X	X	
Suture an eyelid		X	X	
Incise and drain a Meibomian cyst			X	X
Otorhinolaryngology Skills				
Syringe and dry swab an ear	X	X		
Cauterize nose for epitaxis			X	X
Pack nose, cauterize for epistaxis	X	X		
Remove foreign body from the nose		X	X	
Remove foreign body from the ear			X	X
Suture pinna/ear lobe		X	X	
Paediatric Skills				
Assess growth and classify malnutrition	X	X		
Well newborn check	X	X		
Administer medication using aerosol/spacer	X	X		
Administer IM injection – child/neonate	X	X		
Perform Tine test and Mantoux test	X	X		
Obtain capillary blood sample – heel/finger	X	X		
Set up intravenous infusion – child	X	X		
Assess gestational age at birth	X	X		
Kangaroo mother care	X	X		
Insert nasogastric tube		X	X	
Developmental assessment	X	X		
Insert stomach tube – neonate/child		X	X	
Venous blood sampling – peripheral/jugular			X	
Perform lumbar puncture – child			X	X
Set up incubator correctly			X	X
Set up intraosseous infusion			X	X
Insert urinary catheter – child/neonate			X	X
Set up phototherapy for jaundiced baby			X	X
Suprapubic bladder puncture – child			X	X
Resuscitate newborn		X	X	
Advanced CPR – child		X	X	
Perform lymph node aspiration biopsy – child		X		
Assess child abuse (sexual/non-sexual)		X	X	

Procedure to be Performed	Level of Competence			
	Independent G1	Supervised G2	Elective G3	Excluded G4
Perform umbilical vein catheterization			X	X
Insert inter-costal drain – child/neonate				X
Perform ventricular tap for hydrocephalus				X
Exchange blood transfusion			X	X
Surgical Skills				
Incise and drain an abscess	X			
Perform needle aspiration biopsy of any area		X	X	
Fine needle aspiration biopsy of breast lump			X	X
Perform proctoscopy			X	X
Excise lumps/bumps (e.g., sebaceous cyst)		X		
Perform cryotherapy/cauterization		X		
Debride wounds or burns		X		
Incise and drain perianal haematoma			X	X
Apply compression dressing to venous ulcer			X	X
Perform appendectomy				X
Perform rigid sigmoidoscopy to 18 cm				X
Oral and Maxillofacial Surgical Skills				
Administer inferior alveolar nerve block	X			
Administer infiltration anaesthesia	X			
Routine extraction of teeth	X			
Incise and drain facial abscesses	X			
Suture of minor facial lacerations	X			
Dress of extraction sockets	X			
Prepare eyelet wires	X			
Place eyelet wires	X	X		
Place arch bars	X	X		
Reduce acute TMJ dislocation	X	X		
Place NG tube	X	X		
Set up IV line	X	X		
Reduce simple jaw fractures	X	X		
Immobilize simple jaw fractures	X	X		
Dress facial wounds	X	X		
Administer IM injection	X	X		
Administer subcutaneous injection	X	X		
Excise small epulis	X	X		
Transplant/re-implant teeth		X	X	
Prescribe drugs	X	X		
Perform minor alveolotomy and alveolectomy	X	X		
Oral Pathology/Oral Medicine Skills				
Process and stain surgical specimen		X	X	
Smear cytological specimen		X	X	
Cut up and trim biopsy specimen		X	X	
Perform sialometry		X	X	
Oral/Dental Radiology Skills				
Take peri-apical radiographs	X	X		
Take bite wing radiographs	X	X		
Take occlusal radiographs	X	X		
Take panoramic radiographs		X	X	
Process radiographic films	X	X		

Procedure to be Performed	Level of Competence			
	Independent G1	Supervised G2	Elective G3	Excluded G4
Paedodontics Skills				
Apply topical fluoride	X	X		
Place pit and fissure sealants	X	X		
Restore with preventive resin	X	X		
Perform acid etch restorative technique	X	X		
Place amalgam restoration	X	X		
Apply stainless steel crowns	X	X		
Apply acrylic jacket crowns	X	X		
Apply porcelain jacket crowns	X	X		
Perform vital pulpotomy		X	X	
Perform non-vital pulpotomy		X	X	
Perform pulpectomy		X	X	
Perform apexification		X	X	
Treat fractured teeth		X	X	
Treat mobile teeth		X	X	
Manage the anxious patient		X	X	
Extract deciduous teeth	X			
Orthodontics skills				
Manipulating wires for removable orthodontic appliances		X	X	
Manipulating wires for passive orthodontic appliances		X	X	
Tracing points and lines on cephalometry		X	X	
Periodontology Skills				
Perform scaling and polishing of teeth	X			
Perform gingivectomy and gingivoplasty		X	X	
Perform periodontal splinting		X	X	
Perform periodontal flap operations			X	X
Perform mucogingival surgical techniques			X	X
Manage bone defects and furcation involvement				X
Perform root amputation and resection				X
Perform Guided tissue regeneration				X
Community Dentistry Skills				
Perform atraumatic restorative technique		X	X	
Apply topical fluoride	X	X		
Perform dietary counselling	X	X		
Instruct on plaque control and motivation	X	X		
Educate on oral hygiene	X	X		
Restorative Dentistry Skills				
Take mouth impressions	X	X		
Mount dental models	X	X		
Set up teeth	X	X		
Produce wax patterns on dental casts	X	X		
Fabricate models	X	X		
Survey dental casts		X	X	
Fabricate acrylic partial dentures	X	X		
Fabricate chrome cobalt dentures			X	X
Fabricate acrylic complete dentures		X	X	
Place amalgam restorations	X	X		
Place glass ionomer cement	X	X		

Procedure to be Performed	Level of Competence			
	Independent G1	Supervised G2	Elective G3	Excluded G4
Place composite restoration	X	X		
Perform root canal treatment	X	X		
Place rubber dam	X	X		
Perform bleaching of teeth		X	X	
Perform endodontic surgery		X	X	
Perform crown and bridge restorations		X	X	
Urology Skills				
Perform penile block				X
Insert suprapubic catheter				X
Perform circumcision				X
Drain hydrocoele				X
Do open suprapubic catheter insertion				X
Perform suprapubic bladder aspiration				X
Orthopaedic Skills				
Apply cast – below knee, below elbow			X	X
Reduce shoulder dislocation			X	X
Apply finger and hand splints				X
Reduce closed fracture – hand, forearm				X
Set up traction (skeletal or skin)				X
Aspirate and inject knee joint				X
Anaesthetic Skills				
Obtain airway control using an oropharyngeal airway	X			
Monitor patient in recovery room	X	X		
Intubate patient and ventilate patient using mask and Ambu bag	X	X		
Monitor patient during anaesthetic	X	X		
Set airflows – McGill, circle, T-piece		X	X	
Check Boyle's machine		X		X
Use laryngeal mask for airway management		X		
Administer Ketamine anaesthesia		X	X	
Sterilize equipment		X		
Insert central venous line			X	X
Reverse muscle relaxation			X	X
Perform intravenous induction		X	X	
Administer general anaesthetic			X	X
Perform inhalation induction		X	X	
Administer spinal anaesthetic		X	X	
Perform Bier's block				X
Administer local anaesthetic	X	X		
Emergency Medicine Skills				
Measure Glasgow Coma Scale	X			
Administer oxygen	X			
Administer local anaesthesia	X			
Suture lacerations	X			
Obtain pressure control of haemorrhage	X			
Primary survey	X			
Administer blood transfusion	X			
Calculate percent body burn injury	X			
Secondary survey	X			

Procedure to be Performed	Level of Competence			
	Independent G1	Supervised G2	Elective G3	Excluded G4
Perform advanced CPR – adult	X			
Relieve choking	X			
Insert inter-costal chest drain		X		
Remove splinter or fish hook		X		
Immobilize spine		X		
Perform a ring block	X	X		
Transport critically ill patient	X	X		
Drain subungual haematoma		X		
Administer rabies prophylaxis		X	X	
Relieve tension pneumothorax	X	X		
Perform gastric lavage		X		
Perform synchronized cardio version			X	
Perform venous cut down			X	
Reduce TMJ dislocation		X	X	
Set up external electrical cardiac pacing				X
Perform cricothyroidotomy		X	X	
Perform endotracheal intubation			X	
Treat acute severe asthma	X	X		
Offer first-line treatment for tetanus	X			
Treat hypoglycaemia	X			
Offer first-line care for hyperglycaemic emergencies	X			
Offer first-line care for acute stroke	X			
Offer first-line treatment for acute coronary syndromes	X			
Offer first-line treatment for status epilepticus	X			
Offer first-line treatment for haematemesis	X			
Offer first-line treatment for acute pulmonary oedema	X			

PART 4. RULES AND REGULATIONS

4.1 RULES AND REGULATIONS FOR THE MBBS DEGREE PROGRAMME

Courses of instruction shall be provided leading to the Degree of Bachelor of Medicine, Bachelor of Surgery, denoted by the letters MBBS. A distinction may be awarded to candidates of special merit in any subject. Study for the degree shall be on a full-time basis.

4.1.1 ADMISSION REQUIREMENTS

Shall be as determined by the Senate of the university.

4.1.2 LENGTH OF COURSES AND EXAMINATION

The curriculum for the MBBS degree shall normally extend over five academic years. However, candidates may be permitted by the Senate to extend the period of study on grounds of absence from the university or from the relevant courses of instruction because of ill health or for other reasons as approved.

4.1.3 EXAMINATIONS FOR MBBS DEGREE

The final examination for the MBBS degree shall be in four parts. At least 30 percent of the marks awarded in all of the four parts of the examination shall be derived from a continuous assessment of the candidate's progress.

4.1.3.1 MBBS DEGREE PART I FINAL EXAMINATION

The subjects of the examination shall be:

Anatomy (including genetics)

Physiology (including psychology)

Biochemistry (including PHS)

i. To pass the MBBS degree Part I Final Examination, candidates must score a minimum of 50 percent in anatomy, 50 percent in biochemistry, and 50 percent in physiology.

ii. All candidates shall take the Part I Final Examination at the end of their third semester after admission to the course. Candidates who satisfy the examiners in the whole examination shall proceed to the introductory clinical courses.

iii. No candidate shall be admitted for the MBBS degree Part II Final Examination unless he has passed the General Studies GES examinations as applicable.

4.1.3.2 CANDIDATES WHO FAIL

i. Candidates who fail in either two or three subjects of the MBBS Degree Part I Final Examination will be required to repeat the year and will join the first year class for the second semester.

ii. Candidates who fail in one subject only may be permitted by the Senate, on the recommendation of the Academic Board, to proceed to the introductory clinical courses and to be re- examined (after a minimum remediation period of eight weeks) in the subject in which they were referred. Such candidates shall be required to attend a revision course in the subject in which they were referred, along with their participation in the introductory clinical courses. They should continue to attend the revision course on a part-time basis at the completion of the introductory clinical courses until the re-examination takes place.

iii. Candidates who are unsuccessful in the referred examination shall be deemed to have failed the entire Part I Final Examination and shall be required – after appropriate full-time instruction in the preclinical department – to present themselves for re-examination in all subjects the following year, and shall be required to attend the introductory clinical postings for a second time.

iv. Candidates who fail any or all of the subjects at this third attempt shall be allowed to attempt these subjects in a second resit examination. All other rules guiding referred examinations shall apply.

v. Failure in any of the three subjects at the fourth and final attempt will result in withdrawal from the programme.

vi. Subject to powers conferred on the Senate to extend the period of study as specified above, candidates who fail to complete the Part I Final Examination within 33 months after admission to the course shall be required to withdraw from the course.

4.1.4 MBBS DEGREE PART II FINAL EXAMINATION

The subjects of this examination shall be:

Pathology

Pharmacology

i. To pass the MBBS Degree Part II Final Examination, candidates must score a minimum of 50 percent in pathology and 50 percent in pharmacology.

ii. No candidate shall be admitted to the MBBS Degree Part II Final Examination unless he has completed a minimum of 72 weeks of study after the Part I Final Examination.

iii. No candidate shall be admitted to the Part II Finial Examination unless he has passed in all subjects of the Part I Final Examination.

iv. Candidates attempting the Part II Final Examination for the first time shall present themselves for examination in both subjects upon satisfactory completion of the requisite postings.

v. Candidates who fail to satisfy the examiners in one or both subjects of the examination may proceed with their clinical postings but must submit themselves for re-examination in the subject(s) in which they failed after a minimum of eight weeks of remediation.

vi. Candidates who fail in any of the subject(s) of the resit examination shall be deemed to have failed the entire examination for the Part II Final Examination and shall be required – after appropriate courses of instruction – to present themselves for re-examination in the entire

Part II Final Examination in the following year. Such candidates, if successful, shall repeat the clinical postings following the repeat Part II Final Examination before proceeding to the Part III Final Examination.

vii. In the MBBS degree Part II Final Examination and the BDS Part IIB degree Final Examination, candidates who – after repeating the year – fail either or both of the two subjects at a resit examination, shall be asked to withdraw from the programme.

viii. No candidate may proceed to the Part III Examination unless he has passed both subjects in the Part II Examination.

4.1.5 MBBS DEGREE PART III FINAL EXAMINATION

The subjects of the Part III Final Examination shall be:

Paediatrics

Obstetrics and Gynaecology

i. To pass the MBBS Degree Part III Final Examination, candidates must score a minimum of 50 percent in paediatrics and 50 percent in obstetrics and gynaecology.

ii. No candidate shall be admitted to the MBBS Degree Part III Final Examination unless he has completed a minimum of 100 weeks of study after the Part I Final Examination.

iii. No candidate shall be admitted to the Part III Final Examination unless he has passed both subjects of the Part II Final Examination.

iv. Candidates attempting the Part III Final Examination for the first time shall present themselves for examination in both subjects upon satisfactory completion of the requisite postings.

v. Candidates must submit themselves for examination in both subjects on the first occasion.

vi. Candidates who fail to satisfy the examiners in one or both subjects of the examination may proceed with their clinical postings but must submit themselves for re-examination in the subject(s) in which they failed after 12 weeks of remediation.

vii. Candidates who fail to satisfy the examiners in either or both subjects of the Part III Final Examination at the second attempt will be deemed to have failed the entire examination. They will not be permitted to proceed to the Part IV Final Examination, but after repeating the appropriate courses of instruction they may re-enter for the entire Part III Final Examination the following year. If successful, they will then repeat the postings leading to the Part IV Final Examination.

viii. No candidate may proceed to Part IV Final Examination unless he/she has passed both subjects of the Part III Final Examination.

ix. Candidates who fail to satisfy the examiners in one or both subjects of the examination may proceed with their clinical postings but must submit themselves in the following year for re-examination in the subject(s) in which they failed.

x. In the MBBS degree Part III Final Examination and the BDS degree Part IIIB Final Examination, candidates who – after repeating the year – fail either or both of the two subjects at a resit examination shall be asked to withdraw from the programme.

4.1.6 MBBS DEGREE PART IV FINAL EXAMINATION

The subjects of the MBBS Degree Part IV Final Examination shall be:

Medicine

Psychiatry

Surgery

Preventive and Social Medicine

i. To pass the MBBS Degree Part IV Final Examination, candidates must score a minimum of 50 percent in each of the four subjects.

ii. No candidate shall be admitted to the MBBS Degree Part IV Final Examination unless he has completed a minimum of 140 weeks of study after the Part I Final Examination.

iii. No candidate shall be admitted to the Part IV Final Examination unless he has passed in all subjects of the Part III Final Examination.

iv. Candidates attempting the Part IV Final Examination for the first time shall present themselves for examination in all four subjects upon satisfactory completion of the requisite postings.

v. Candidates who fail to satisfy the examiners in any of the four subjects must submit themselves for re-examination in the subjects in which they failed after a minimum of 12 weeks of remediation in the appropriate courses of instruction.

vi. Candidates who fail to satisfy the examiners any of the subjects of the Part IV Final Examination at the second attempt will be deemed to have failed the entire examination. They may re-enter for the entire Part IV Final Examination of the following year.

vii. Candidates who repeat the year and are then referred in any of the subjects will be allowed a final attempt at the referred subject at the next resit examination. Failure at this fourth and final attempt will result in withdrawal from the programme.

4.2 RULES AND REGULATIONS FOR THE BDS DEGREE PROGRAMME

Courses of instruction shall be provided leading to the Bachelor of Dental Surgery degree, designated by the letters BDS.A distinction may be awarded to candidates of special merit in any course. Study or the degree shall be on a full-time basis.

4.2.1 ADMISSION REQUIREMENTS

Shall be as determined by the university Senate

4.2.2 LENGTH OF COURSES AND EXAMINATION

The curriculum for the BDS degree shall normally extend over five academic years. However, candidates may be permitted by the Senate to extend the period of study on grounds of absence from the university or from the relevant courses of instruction because of ill health or for other reasons as may be approved.

4.2.3 EXAMINATIONS FOR THE BDS DEGREE

The final examination for the BDS degree shall be in six parts. Thirty percent of the marks awarded in all six parts of the examination shall be derived from a continuous assessment of the candidate's progress.

4.2.3.1 BDS DEGREE PART I FINAL EXAMINATION

Subjects, rules, and regulations are the same as the MBBS Degree Part I Final Examination.

4.2.3.2 BDS DEGREE PART II FINAL EXAMINATION

Subjects, rules, and regulations are the same as the MBBS Degree Part II Final Examination.

4.2.3.3 BDS DEGREE PART III FINAL EXAMINATION

The subjects for the BDS Degree Part III Final Examination shall be:

Paediatrics

Medicine

Surgery

i. To pass the BDS degree Part III Final Examination, candidates must score a minimum of 50 percent in paediatrics, 50 percent in medicine, and 50 percent in surgery.

ii. No candidate shall be admitted into the Part III Final Examination unless he has passed both subjects of the Part II Examination.

iii. Candidates attempting the Part III Final Examination for the first time shall present themselves for examination in all the three subjects upon satisfactory completion of the requisite postings.

iv. Candidates must submit themselves for examination in all the three subjects on the first occasion.

v. Candidates who fail to satisfy the examiners in any of the three subjects must submit themselves for re-examination in those subjects in which they failed after a minimum of eight weeks of remediation in the appropriate courses of instruction.

vi. Candidates who fail to satisfy the examiners in any of the subjects of the Part III Final Examination at the second attempt shall be deemed to have failed the entire examination.

vii. Candidates who have failed will not be permitted to proceed to the Part IV Final Examination, but after repeating the appropriate courses of instruction may re-enter for the entire Part III Final Examination the following year. If successful, they will then repeat the posting leading to the Part IV Final Examination.

viii. In the BDS Degree Part III Final Examination, candidates who – after repeating a year – fail any of the subjects at a resit examination, shall be asked to withdraw from the programme.

4.2.4 BDS DEGREE PART IV FINAL EXAMINATION

The subject for the BDS degree Part III Final Examination shall be Laboratory Techniques in Dentistry, which consists of:

Prosthetics

Operative Technique

Science of Dental Materials

i. To pass the BDS degree Part III Final Examination, each candidate must score a minimum of 50 percent in all sections of the subject.

ii. No candidate shall be admitted to the BDS Degree Part IV Final Examination unless he has passed in all subjects of the Part III Final Examination.

iii. Candidates who fail to satisfy the examiners in the subject of the examination may proceed with their clinical posting in dentistry but must submit themselves for re-examination after eight weeks of remediation.

iv. Candidates who fail to satisfy the examiners in the subject of the examination at the second attempt will be deemed to have failed the entire examination. They will not be permitted to proceed to the Part V Final Examination, but after repeating the course of instruction they may re-enter for the entire Part IV Final Examination the following year. If successful, they will then repeat the posting leading to the Part V Final Examination.

v. No candidate may proceed to the Part V Final Examination unless he/she has passed the subject of the Part IV Final Examination.

vi. In the BDS Degree Part III Final Examination, candidates who – after repeating the year – fail the subject at a resit examination shall be asked to withdraw from the programme.

4.2.5 BDS DEGREE PART V FINAL EXAMINATION

The subjects for the BDS Degree Part V Final Examination shall be:

Oral Pathology (including Oral Medicine and Radiology)

Child Oral Health

i. To pass the BDS Degree Part V Final Examination, candidates must score a minimum of 50 percent in oral pathology and 50 percent in child oral health.

ii. No candidate shall be admitted to the BDS Degree Part V Final Examination unless he has passed in the subject of the Part IV Final Examination.

iii. Candidates who fail to satisfy the examiners in the subjects of the examination may proceed with their clinical posting in dentistry but must submit themselves for re-examination after 12 weeks of remediation.

iv. Candidates who fail to satisfy the examiners in the subject of the examination at the second attempt will be deemed to have failed the entire examination. They will not be permitted to proceed to the Part VI Final Examination, but after repeating the course of instruction they may re-enter for the entire Part V Final Examination the following year. If successful, they will then repeat the posting leading to the Part VI Final Examination.

v. No candidate may proceed to the Part VI Final Examination unless he/she has passed the subjects of the Part V Final Examination.

vi. In the BDS degree Part V Final Examination, candidates who – after repeating the year – fail the subject at a resit examination shall be asked to withdraw from the programme.

4.2.6 BDS DEGREE PART VI FINAL EXAMINATION

The subjects for the BDS Degree Part VI Final Examination shall be:

Oral and Maxillofacial Surgery

Restorative Dentistry

Periodontology and Community Dentistry

i. To pass the BDS degree Part VI Final Examination, candidates must score a minimum of 50 percent in each of the three subjects.

ii. No candidate shall be admitted to the BDS Degree Part VI Final Examination unless he has passed the subjects of the Part V Final Examination.

iii. Candidates attempting the Part VI Final Examination for the first time shall present themselves for examination in the two subjects upon satisfactory completion of the requisite postings.

iv. Candidates must present themselves for examination in all the subjects for the first occasion.

v. Candidates who fail to satisfy the examiners in the two subjects of the examination must submit themselves for re-examination in those subjects in which they failed after a minimum of 12 weeks of remediation in the appropriate courses of instruction.

vi. Candidates who fail to satisfy the examiners in any of the subjects of the Part VI Examination at the second attempt will be deemed to have failed the entire examination. They may re-enter for the entire Part VI Final Examination in the following year.

vii. Candidates who repeat the year and are then referred in any of the subjects will be allowed a final attempt at the referred subjects at the next resit examination. Failure at this fourth and final attempt will result in withdrawal from the programme.

4.3 FORMAT OF THE MBBS AND BDS EXAMINATIONS

Shall be as determined by the university Senate.

4.4 GENERAL NOTES

4.4.1 The 50 percent pass mark notwithstanding, to pass each part of the MBBS and BDS degree final examination, candidates shall satisfy the examiners in their "character and learning."

4.4.2 All parts of the examination shall include questions on AMS, CAB, CAM, MAP, and MHD.

4.4.3 Candidates shall be required to fulfill the following to qualify to sit for each part of the MBBS and BDS degree examinations:

i. A minimum of 75 percent attendance of didactic and practical/clinical teaching sessions. For this purpose, a student would be deemed to have attended a teaching session only if he/she was present for at least 75 percent of the allotted time.

ii. Without prejudice to the above, completion to the satisfaction of the college of approved practical/clinical course work as may be defined in the departmental syllabi. These shall be recorded in a portfolio comprising evidence of learning activities for each posting done. This shall include:

   a. Reports on practical sessions in the core and applied basic sciences.

   b. Report on community/social field trips/visits and experience in PSM/Community Medicine, as well as clinical science postings.

   c. Clerking in the clinical science postings.

   d. Logbook of procedures.

   e. Other evidence of individual and group self-directed learning activities

   f. Evidence of formative assessments.

   g. Letters attesting satisfactory conduct from tutorial masters and other teachers, as appropriate.

   h. The student's evaluation of the posting (inclusive of the evaluation of the teachers).

   i. An overall statement of competencies acquired during the posting and contribution of the same to the curricular objectives of the MBBS and BDS courses as relevant.

   j. An "attestation of worthiness" in "learning and character" and satisfactory completion of postings. This shall be signed by the appropriate heads of departments for the subject being examined, based on evidence from the portfolio of continuous assessment as stated above (with particular consideration given to the letter attesting satisfactory conduct from all tutorial masters) and any other relevant information

   k. Candidates shall be required to score a minimum of 50 percent in continuous assessment to qualify to sit for the examination for which the marks apply.

4.5 RESIT EXAMINATIONS, EXAMINERS MEETINGS

4.5.1 Resit examinations shall take place after candidates have attended no fewer than eight weeks of additional instruction for any or all subject(s) failed for the parts I and II MBBS degree examinations and parts I-IV BDS degree examinations, and no fewer than 12 weeks for the parts III and IV MBBS degree examinations and parts V and VI BDS degree examinations.

4.5.2 Students repeating a year after failing a resit examination must present themselves for remediation in the relevant subjects during the entire repeating year, prior to sitting for the repeat examination.

4.5.3 The normal rules of continuous assessment shall apply to the additional postings done to enable the candidates to qualify to participate in resit and repeat examinations.

4.5.4 Except as specified in regulations, candidates shall be allowed a maximum of three attempts in any of the parts of the MBBS and the BDS degree examinations, resit examinations inclusive.

4.5.5 Notwithstanding number 2 above, candidates shall be allowed a maximum 18 semesters (inclusive of the 100-level examinations) to complete the MBBS and the BDS courses.

4.5.6 Candidates who fail any subject in the resit examination of the parts III and IV MBBS degree examinations and the parts III-V BDS degree examinations shall be required to retake the 400-level integrated core lectures prior to sitting for the repeat examinations.

4.5.7 A candidate who – by reason of illness or some other causes acceptable to the university – has been prevented from completing any part of the examination may apply to be credited with his performance in any subjects of the examination in which he/she has satisfied the examiners, provided that he/she submits an application for this purpose to the secretary not later than two weeks after the termination of the relevant examination.

4.5.8 Candidates who – for no acceptable reason – absent themselves from an examination shall be deemed to have failed the examination.

4.5.9 Candidates who fail to qualify to sit for any of the parts of the MBBS and BDS final examinations shall be deemed to have failed the examination.

4.5.10 Candidates who – for reasons acceptable to the university – have been unable to sit an examination, may enter the examination at the next available occasion.

4.5.11 Department examiners' meetings shall normally be held on the last day of the department's examination, while faculty examiners' meetings shall normally be held the day after the last relevant examination. The list of successful candidates for the degree shall be published no more than 24 hours after the faculty examiners' meeting, with the names arranged alphabetically, including those who pass with distinction in any subject.

4.5.12 Candidates who have attended approved courses in other institutions may – on the recommendation of Academic Board – be exempted by the Senate from part or parts of the course or courses leading to the MBBS degree, but not from any part of the examination.

4.5.13 All regulations governing the conduct of examinations in the university apply to these examinations.

4.5.14 Any of these regulations may, from time to time, be altered by the Senate on the recommendation of the Academic Board.

Note: The pass mark for MBB Sand BDS degree Final Examinations is 50 percent. However, 100-level courses that are operated under the course system have a pass mark of 40 percent.

PART 5. CONCLUSION

There have been numerous challenges in providing sound and qualitative medical education in Nigeria, and these challenges are ever increasing: inadequate infrastructure, facilities, and teachers, and increasing demand for training. There remains a critical need to continue to contribute to solutions for health care problems in Nigeria by continuing to provide medical personnel who understand the special circumstances of the Nigerian environment and can function effectively and efficiently as core health care providers in the Nigerian setting.

We have developed a template for integrated MBBS and BDS curricula that takes the current and future health care needs of our country into consideration whilst meeting global standards. We are, however, mindful that medical schools adopting an integrated curriculum will also have to prepare to manage the demands that will accompany such a significant change in the philosophy of medical instruction. This is particularly important in situations where older curricula have been in existence for a long while and "territories" have been identified and "empires" created. A skillful "people-manager" should be appointed to lead the curriculum development and implementation processes that will be required. It must be emphasized that implementing a revised curriculum (especially when it includes integrated components) takes time for a good outcome and should not be hurried – not the least because it requires regular and repeated training of teachers to ensure that they are familiar with the differences in methods of instruction and demands on their contact time with students, as these will ultimately have consequences on their other activities (research and service) and thus their career progression.

Particular attention also must be paid to the students, both to those who will be instructed with this new instrument and to their seniors in the early years of introducing this revised curriculum. This is because the usual "mentoring" of new entrants by older students will be affected negatively in this first phase, since the older students will have no experience of this revised training model. In addition, the older students are bound to wonder if their training will not be considered inferior with the introduction of these updated curricula, with a potential negative effect on their career progression; they may also be envious of their junior colleagues, creating a conflict situation. Counselling facilities must be made available for students to resolve and/ameliorate these emotions.

The medical schools must carry along their associated teaching hospitals, as the hospitals have a major role to play in the curricula implementation, which will have an impact on protocols of patient care. The cost-recovery orientation of the teaching hospitals and the increased awareness of patients about standards of care must be taken into consideration to reduce their impact on student instruction, particularly as regards skills acquisition by the students. Statutorily, the two institutions have seats on each other' boards, and the chairman of the Medical Advisory Committee is a member of the medical school curriculum committee. All these avenues for communication must be utilized to ensure an implementation process that is as smooth as possible. We are hopeful that the NUC and MDCN, as well as all medical schools who utilize all or part of this updated curricula template, will evaluate its use appropriately so that the information gathered can be utilized for future revisions.

ANNEX A. TEACHING AND NON-TEACHING FACILITATORS, OF MEDICINE, UNIVERSITY OF IBADAN AND UNIVERSITY COLLEGE HOSPITAL, (UCH) IBADAN

Prof. M. Temitayo Shokunbi	Departments of Anatomy and Surgery
Prof. Simbo D. Amanor-Boadu	Department of Anaesthesia
Dr. J.K. Ladipo	Department of Surgery
Dr. A. Odukogbe	Department of Obstetrics and Gynaecology
Dr. K.O. Osungbade	Department of Community Medicine
Dr. A.O. Oluwasola	Department of Pathology
Dr. Achiaka Irabor	General Outpatient Department, UCH
Dr. Mojisola Atalabi	Department of Radiology
Dr. A.A. Adeolu	Department of Surgery
Dr. Atinuke M. Agunloye	Department of Radiology
Dr. Hannah Dada-Adegbola	Department of Medical Microbiology
Dr. Ike Lagunju	Department of Paediatrics
Dr. Funmi Olopade	Department of Anatomy
Mr. B.E. Osinuga	Department of Pharmaceutics and Industrial Chemistry
Mr. M. Omoleke	Secretarial Assistant
Mr. O. P. Akinwale	Computer Operator

ANNEX B: PERMISSION FROM THE LIAISON OFFICE, THE JOHN D. AND CATHERINE T. MACARTHUR FOUNDATION GRANT

UNIVERSITY OF IBADAN, IBADAN, NIGERIA
THE LIAISON OFFICE, THE JOHN D. AND CATHERINE T. MACARTHUR FOUNDATION GRANT

G.O.S. EKHAGUERE, PhD, DIC (London)
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Tel: +234-(0)803-324-1859
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Dr Adeleke Oluwaseun,
Technical Specialist,
Health Systems 20/20 Project,
35, Justice Sowemimo Street,
Asokoro, Abuja FCT

August 15, 2012

Dear Dr Adeleke,

Re: REQUEST FOR PERMISSION TO USE THE UI'S MEDICAL & DENTAL CURRICULUM

I refer to your letter of July 20, 2012, concerning the subject above.

A cardinal principle of the John D. and Catherine T. MacArthur Foundation is that the outcomes of its sponsored projects and activities should be disseminated as widely as possible to potential beneficiaries, not only within the Nigerian University System but also throughout the entire nation, in the hope that they would then foster diverse knock-on effects that could contribute towards rapid nation building. It is therefore extremely easy for me to convey the requested approval for you to obtain and utilize the *Revised 2010 MBBS Curriculum* in the way you have described. In doing so, kindly endeavour to amply acknowledge the John D. and Catherine T. MacArthur Foundation, Chicago, the University of Ibadan, Ibadan, and the project's coordinator, Professor E. Oluwabunmi Olopade-Oloapa, in any of your publications/products which incorporate any aspects/ideas of/in the document.

Please accept the assurances of my highest esteem.

Yours sincerely,

Professor G O S EKHAGUERE

cc: Professor E. Oluwabunmi Olopade-Olaopa